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FIRST REPORT

OF THE

METEOROLOGICAL COMMITTEE

TO THE

LORDS COMMISSIONERS OF HIS MAJESTY'S TREASURY,

For the Year ended 31st March, 1906.

Presented to both Houses of Parliament by Command of His Majesty.

A.

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THE METEOROLOGICAL COMMITTEE, 1905-6.

Appointed by Minute of the Lords Commissioners of H.M. Treasury, dated 20th May, 1905.

Mr. W. N. SHAW, Sc.D., F.R.S., Director. *Chairman.*

Captain ARTHUR M. FIELD, R.N., F.R.S., Hydrographer to the Navy.

Captain A. J. G. CHALMERS, Professional Officer of the Marine Department, Board of Trade.

Mr. W. SOMERVILLE, Sc.D., Assistant Secretary of the Board of Agriculture and Fisheries.

Sir GEORGE H. DARWIN, K.C.B., F.R.S., University of Cambridge.

Professor ARTHUR SCHUSTER, F.R.S., University of Manchester.

Mr. G. L. BARSTOW, nominated by the Treasury.

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FIRST REPORT

OF THE

METEOROLOGICAL COMMITTEE

For the Year ended 31st of March, 1906.

MAY IT PLEASE YOUR LORDSHIPS,

Constitution of the Committee.

IN accordance with Your Lordships' instructions, the Committee appointed by Treasury Minute dated 20th May, 1905, met on 31st May and took over the administration of the Parliamentary grant and the general control of the Office, the direction of which had been entrusted to Mr. W. N. Shaw by Your Lordships' letter of 8th April.

Meetings were also held on 5th July, 1st November, 6th December, 1905, and 7th February, 1906.

As suggested by Sir G. H. Murray, in a letter dated 23rd May, 1905, transmitting a copy of the Minute referred to, the Committee considered the following points:—

(1) Whether the Committee should continue to be registered under the Companies Acts, or whether some other constitution would be preferable?

(2) The powers to be delegated to the Director, and

(3) The arrangements to be made for the administration and audit of the Parliamentary grant.

The conclusions at which the Committee arrived on these points have already been reported to Your Lordships.

The Committee were of opinion that some form of incorporation was advisable, and were in favour of incorporation by Royal Charter, but pending the settlement of the question of permanent premises suitable for the work of the Office, it was agreed to request that the property held by the Meteorological Council should be vested in one of the permanent Secretaries of the Treasury and the Director of the Office for the time being as trustees, for the use of the Committee.

The arrangements for the transfer of the property in accordance with this request are in progress under the advice of the Solicitors' Department of the Treasury, but are not yet completed. In the

meantime the Meteorological Council, at a meeting held on 12th July, 1905, authorised two of their members—Sir G. Darwin and Mr. Shaw—to carry out on their behalf any transfer that might be required.

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ncil.

The Committee desire to recognise at the outset the appropriateness of the organisation established by the Council for the work of the Office, and they concur with pleasure in the desire expressed by Your Lordships that the work should proceed generally on the lines hitherto followed. They desire especially to place on record their appreciation of the services rendered in the administration of the Office by Sir R. Strachey, the Chairman of the Council for 22 years; by Sir William Wharton, who was for 20 years a member of the Council, *ex officio*, as Hydrographer of the Navy; by Mr. Francis Galton, who had so large a share in the foundation and the management of the Office under the control of the Royal Society; and by Dr. Buchan, who brought to the service of the Council an unique experience of meteorological work. They cannot omit a reference to the melancholy death of Sir William Wharton at Cape Town so shortly after his retirement from active service on the Council, nor can they fail to note that his last scientific contribution—the address to the Geographical Section of the British Association in South Africa—showed the same keen insight into meteorological problems that was characteristic of his work as a member of the Council. His name will remain associated with those of Henry Smith, Stokes, Richards, De la Rue, and Stone, men of the highest scientific distinction, who have in past years taken part in the management of the meteorological service of the country.

William
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the Navy.

In accordance with the recommendations of Sir H. Maxwell's Committee, arrangement has been made under which the Committee continue to organise and carry out the supply of meteorological instruments to the Naval Depôts for the use of H.M. ships in the same way as heretofore, but the Lords Commissioners of the Admiralty reimburse the Committee to the extent of the cost of the instruments, and also contribute £100 for the departmental expenses incidental to the organisation and management of the supply. The Committee are also relieved of the responsibility of contributing towards the maintenance of the observatories on Ben Nevis and at Fort William, and these items, together with the economies resulting from the changes in the system of management, improve the financial position of the Committee as compared with that of the Council to the extent of £1,300. On the other hand, it must be noted that the statement of accounts presented by the Council for the year 1904–5 shows an expenditure out of accumulated balance, over and above the Parliamentary grant for the year, to the extent of £800. The Committee have made careful inquiry as to the grounds for this excess of expenditure over income, and they learn that, as regards £250, the deficit was anticipated because the grant to the Fort William Observatory was continued, under special circumstances, beyond the time originally fixed for its termination, and the rest was due partly to exceptional expenditure for instruments and partly to the increase of expenses incidental to a remarkable development of the ordinary work of the Office, particularly in the Marine Branch

and in the Branch which is concerned with the collection of observations from stations established by local authorities and private observers.

As these incidental expenses cannot be curtailed unless the work is restricted, and the necessary restriction cannot be undertaken without careful consideration, the sum immediately available for extension in other directions recommended by various authorities is considerably less than the total of the items enumerated as those upon which the financial position has been improved by the changes introduced into the constitution of the Office.

The Committee have therefore found it necessary to be cautious about embarking upon new developments involving fresh expenditure.

They have arranged that the annual payment made for many years past to Dr. Buchan as Inspector for Scotland, shall be continued to him for the time being in consideration of the work upon which he is engaged in connexion with the discussion of the results obtained at the Ben Nevis Observatories.

Commander Campbell Hepworth, C.B., R.N.R., continues as Marine Superintendent, and the clerical staff has also been continued upon the same terms as under the Council.

New appointments.

The Committee have deemed it desirable to place the statistical work of the Office and the charge of the Library, with which is associated the duty of making the vast accumulation of meteorological information from all parts of the world practically available for scientific and industrial purposes, in the hands of a Superintendent, and a new office has therefore been constituted with that object. Furthermore, the supply of instruments to the Navy and to Colonial Governments, as well as to the Mercantile Marine and the land stations in direct connexion with the Office, raises so many important questions that require special scientific knowledge that the Committee have decided to add to the staff of the Office a Superintendent of Instruments who should be a man of high scientific attainments competent to assist the Director with reference to those and other scientific questions.

To meet these requirements it has been necessary for the Director to forego the advantage of a private scientific assistant, an appointment which has been successfully filled for the past few years by Mr. R. G. K. Lempfert. Mr. Lempfert undertook, temporarily, the duties of Superintendent of Instruments from the beginning of October, and at the close of the year he was transferred to the post of Superintendent of Statistics. Mr. Ernest Gold, B.A., of St. John's College, Cambridge (Third Wrangler, 1903, and Natural Sciences Tripos, Part II., 1904), has been selected for the post of Superintendent of Instruments and will take up his duties in June. The Committee consider it undesirable that the post of private scientific assistant to the Director should remain permanently in abeyance, and they intend to revise the scheme of operations of the Office in such a way as to provide for the re-establishment of the post as soon as possible.

restigation the upper

The investigation of the upper air, which had been repeatedly pressed upon the Council, was brought before the Committee upon the consideration of the resolutions of the Fourth International Conference for Scientific Aeronautics forwarded by the Treasury with a note from the Russian Ambassador, at the request of His Imperial Highness the President of the Academy of Sciences of St. Petersburg, together with a report of the Director, as the representative of the Government, on the nomination of the Board of Education, at the above mentioned Fourth International Conference on Scientific Aeronautics held in St. Petersburg in September, 1904.

Upon the consideration of the report the Committee authorised the assignment of a sum of £500 per annum for the promotion of the investigations in co-operation with corresponding institutions on the Continent of Europe and elsewhere, including a contribution towards the publication of the results of the international observations of temperature, &c., in the upper air, as well as of auxiliary observations of clouds. They have been fortunate in securing the services of Mr. W. H. Dines, F.R.S., for the organisation and control of experiments with kites and, if practicable, with unmanned balloons. Mr. Dines' work in this direction, on land and from steam vessels, in connexion with a joint committee of the Royal Meteorological Society and the British Association has already been referred to, from time to time, in the Reports of the Meteorological Council.

The objects to be kept in view are as follows :—

(1) The maintenance of a depôt for the construction and testing of apparatus.

(2) The investigation of the upper air over the British Isles by a series of simultaneous ascents on the days of the international ascents (kites and unmanned balloons being used if practicable). Three stations for each day of ascent are to be arranged, if possible, within a range of 100 miles in the first instance, one of them being on the Coast. For the two of these ascents not at the depôt station, the central depôt would supply apparatus and instruct the observers, but would not be responsible for making any payment to the observers.

(3) The supply of apparatus and instruments for the observations of the upper air, to vessels of the Navy or of the Mercantile Marine of which Officers might be willing to take charge of ascents, and the instruction of the observers.

The Committee are glad to note that the scheme of observations of the upper air is likely to be extended by other organisations. Mr. G. C. Simpson, who was acting as volunteer assistant to the Director and undertook at his recommendation some trial experiments on behalf of the joint committee already mentioned, from a trawler in the North Sea belonging to the Royal National Mission to Deep-Sea Fishermen, has now taken up his duties as Lecturer in Meteorology in the University of Manchester, and has made arrangements for kite ascents in Derbyshire.

The opportunities afforded for occasional observations of the upper air by the equipment of the balloon factory at Aldershot encourages the hope that valuable information may be obtained therefrom, especially for the days fixed by international agreement for co-operative work.

Moreover, the Aero Club has appointed a Meteorological Committee with a view to organising meteorological observations in connexion with the aeronautical expeditions of the club.

In order to promote effective co-operation in this important work it seems desirable that all experiments in this direction should be brought to the cognisance of some body representing the various organisations concerned therein. As already mentioned, the Royal Meteorological Society, the British Association, and the Aero Club have established committees, and the Meteorological Committee have appointed the Director and Professor Schuster as their representatives to co-operate with the representatives of the other bodies concerned in the work.

An endeavour has been made to enlist the co-operation of volunteer observers in this investigation, and has met with considerable success. Lieutenant the Hon. C. F. Cavendish, of H.M.S. "Suffolk," has expressed his willingness to make a trial of observations at sea, and Captain A. Simpson, of the steamship "Moravian," an observer for the Office of very long experience, has also undertaken to make a trial of this method of observation as soon as the necessary apparatus can be provided.

On land Mr. C. J. P. Cave, of Ditcham Park, Petersfield, who has already made some successful experiments with kites in Barbados, has provided himself with the necessary apparatus and has carried out a number of successful ascents.

A brief summary of the results of the observations for each week since January 1st, 1906, has been published in the Weekly Weather Report in order that those interested in the investigations may be able to refer the results for any particular day to the meteorological conditions prevailing at the time as represented in the daily maps which form part of the Weekly Report.

Mr. Dines has added to the apparatus a simple means of recording the wind force at the kite level by the trace of a pen which indicates the pull of a small celluloid ball attached to the indicator by a long cotton line. Although this arrangement gives a less delicate indication of the wind force than the small cup anemometer which is often employed for the purpose, it is free from the uncertainties which arise from the variation of the record of a cup anemometer with variation of the inclination of the spindle. It has already given some interesting results, and if corresponding values can be obtained from a few places at a suitable distance apart, very valuable information as to the pressure gradient at different levels and its relation to the wind direction and velocity will be secured by a combination of the results of the wind observations with those for the temperature of the air column over the places of observation.

The Committee have given special attention to the arrangements for the collection of observations from land stations in the British Isles maintained by local authorities or private persons. These observations are collected partly with a view to obtaining adequate information for the regular publications of the Office, and partly as forming a contribution to a body of meteorological data for the purposes of scientific investigations or the requirements of those interested in Agriculture, Sanitary Science, or the various industries which are affected by different conditions of weather.

In the earlier years of the existence of the Office, although it depended very largely upon the voluntary assistance of the officers of the Navy and the captains and officers of the Mercantile Marine for its marine information, there was no regular association with volunteer observers at land stations. Such observers were generally members of one or other of the two societies, the Royal Meteorological Society and the Scottish Meteorological Society, and contributed their observations to those societies for publication in their journals and for other purposes.

By degrees the practice of voluntary observers contributing observations to the Office, grew, and the encouragement of the practice, as well as that of assisting the societies which were already centres for the collection of such information, were among the recommendations contained in the report of Sir William Stirling Maxwell's Committee in 1877.

When the Meteorological Committee of the Royal Society desired to collect information from land stations in 1873 for the publication of an annual volume of observations at *Stations of the Second Order*, in response to an appeal from the International Congress at Vienna, they applied to the societies for copies of observations contributed by some of the voluntary observers in return for a money payment. Later on, when the Council wished for climatological information week by week from inland stations, to supplement that from the telegraphic reporting stations, for the Weekly Weather Report which was initiated in 1879, they appealed to the societies again and the original agreement was extended. In continuation of these arrangements the Council in the year ended 1904–5 obtained information for the annual volume for 1903, from 34 stations, and for the Weekly Weather Report from 17 stations, and in return made payments to the extent of about £235.

On the other hand a large number of observers desire that their observations should appear in the official publications, the daily, weekly, or monthly reports, or should be made as fully available for the use of the public as possible, and they are desirous of sending their observations to the Office under conditions appropriate for that purpose. As many of the stations in England are maintained by local authorities out of public funds, the Office is the most appropriate central depository for copies of the observations, which are of considerable public utility.

There are thus three bodies which collect and publish climatological data for various parts of the British Isles in addition to

the British Rainfall Organisation, now under the direction of Dr. H. R. Mill, which is the central institution for the collection of rainfall data.

The Office is the only institution of the three which issues a Daily or Weekly Weather Report, but as regards the monthly summaries there is a great deal of overlapping. At the same time no one of the three bodies makes or publishes a complete collection of climatological data, and any student of the climatology of the British Isles has a good deal of trouble in ascertaining the extent of the available material. The share which the Office takes in this incomplete system is incidentally a source of very considerable expense, and engages a great deal of the attention of the staff of the Statistical Branch which is unable to keep up with its work. The volume of observations at Stations of the Second Order is very much in arrear. The volume for 1902 is not yet issued, although in the course of the preparation of the returns for the Registrars-General of England and Ireland a good deal of the work for that and future volumes is already done. In various ways it would be advantageous if some of the work of the Statistical Branch could be applied in other directions, and the Committee have had to consider whether they should abandon the general collection of observations from land stations and restrict their attention for official purposes to a selected number of representative stations, or endeavour with the co-operation of the Societies to initiate a joint system for the collection and publication of the results which would be complete and would at the same time avoid the overlapping of publications.

The Committee are of opinion that the latter alternative is the more desirable if suitable provision can be made for the work which it entails.

Conference.

They have invited the societies to send representatives to a Conference with representatives of the Committee. A first meeting of the Conference has already been held, and the Committee hope to be able to report by the end of the year effective progress in the organisation of voluntary observations in the British Isles, in conjunction with the societies, for the common advantage of all three institutions.

Telegraphic facilities.

The work of the Office has to be conducted without the special telegraphic facilities reserved for departments of State under the Telegraph Act, 1863 (26 & 27 Vic. c. 112, sec. 48) and subsequent Acts. The Committee have, however, had the advantage of the good offices of the Treasury in considering, with a representative of the Post Office, the various points raised by the Council in their memorandum presented to Sir Herbert Maxwell's Committee, with the object of placing the telegraphic service of the Office upon a better footing. As the service is maintained for the purpose of storm warnings and forecasts, the effective management of which is difficult under the most favourable circumstances, it seems to the Committee to be specially important that they should take full advantage of any opportunity afforded to them.

They desire to acknowledge the assistance given by the Postmaster General and the value of an arrangement that has resulted

from the negotiations, under which the Post Office will be kept informed about the current details of the working of the service with a view to its improvement.

There are still some matters outstanding which cannot be adequately met.

The meteorological service relies upon telegraphic communication with a number of very remote offices, both for the collection of its information from the observing stations, and the transmission of warnings for the benefit of fishing and coasting vessels. From the nature of the service it is necessary to work close up to the margin of the ordinary hours of attendance at country post-offices, and in some cases it is desirable, both at the beginning and end of the day, to go beyond the limits. It is difficult to adjust the requirements of the service so that the provisions available for the use of the postal telegraphic service by the general public beyond the ordinary hours of attendance shall meet the case in a satisfactory manner. Under those provisions messages may be sent upon payment of a special fee if the attention of the operators can be obtained. There is on the one hand no security that the attention of the operator at a receiving office can be obtained for the reception of a storm warning telegram a few minutes after the ordinary hours for closing, and on the other hand the scale of payment authorised for an occasional message out of office hours when applied to a regular daily service, as of telegrams conveying daily observations, becomes extravagant as compared with the ordinary scale of remuneration for work undertaken for the Committee.

Special consideration is required for two points. First, the initiation of a service of telegrams from observing stations at 7 a.m. to bring the service of this country into line with the international system which has been already referred to on several occasions in the reports of the Meteorological Council; and secondly, the transmission of storm warnings in the evening and on Sundays.

rm rnings.

With regard to the latter, the Committee have followed out the suggestion of the Council and obtained more precise information about the working of the storm warning service by having the telegrams returned from the signal stations with the time of hoisting the signal endorsed upon the form. An examination of these returns shows that in many instances there is a wide discrepancy between the time of despatch of the telegrams from the Office and the time of hoisting the signal. In numerous instances this discrepancy extends to 14 or even to 24 hours. The delay is particularly evident with regard to warnings despatched on Sundays.

In order that warnings of dangerous storms may not be omitted, it has been the practice for two members of the staff of the Office to be on duty on Sunday mornings, and in order that there may be no delay they attend at the Central Telegraph Office instead of the Meteorological Office and receive there the morning observations from the reporting stations in the country and on the Continent, prepare the working chart, and issue warnings if

necessary. The chart cannot be completed, under ordinary circumstances, before 9.30 a.m., and to issue warnings without the fullest information is most undesirable. Consequently the warnings cannot be despatched before 9.30 or a few minutes later, and the post offices at the country stations where storm signals are exhibited, if open on Sunday at all, are as a rule closed at 10 a.m. for the day.

Very few of the Sunday morning messages reach their destination on the day of issue. The Sunday evening messages are many of them also addressed to closed offices and only delivered on the next morning, and the same is the case with a considerable number of the evening messages on week-days which are despatched about 7.30 p.m. and fail to reach on the same evening a number of country offices which close at 8 p.m.

It should be noticed here also that the practice of hoisting storm signals at night has fallen into disuse, and in some cases telegrams arrive when the official in charge of the station is not on duty. Both these causes combine with the absence of special telegraphic arrangements to produce a large number of instances of long delay in the hoisting of the signals after the warnings have been despatched from London.

The Committee feel that some action to remedy this state of affairs is urgently necessary, because the service of storm warnings, which is already extremely difficult on account of meteorological reasons, is not fairly represented by the hoisting of a signal at a long interval after the issue of the warning, when not improbably the danger which was anticipated is already past.

The representative of the Postmaster-General, who went into the matter very carefully, was only able to suggest that the meteorological service should be fixed for such hours as to allow an adequate margin for the occasional pressure of ordinary business and other causes of telegraphic delay, and thus secure that any telegrams despatched in the evening or on Sundays should be delivered on the same day.

The suggested course is by no means free from difficulty : the hours of observation are fixed by international agreement and are not easily changed. For the purpose of noting the development of the meteorological changes upon which warnings and forecasts are based an additional half-hour is not without its importance, and the sacrifice of half-an-hour every day to allow a margin for the transmission of telegrams in the case of contingencies which arise occasionally is at best a balance of disadvantages.

The Committee propose to give the matter further consideration in the current year. The Sunday service in particular, as at present arranged, entails considerable cost and is of little or no practical advantage for its primary purpose of affording warnings of approaching storms. At the same time, in the maintenance of a number of signal stations in direct communication with the Office for the purpose of distributing information about storms it is important that, so far as possible, no storm should be overlooked. If the Office used its discretion to disregard the existence

of a storm because it was improbable that communications would reach the signal stations in time for warning, serious misunderstanding might result; it is therefore doubtful whether the suspension of telegrams in those cases where it is known that the signal station cannot be reached would not lead to a worse result than the telegraphic delays which at present seem to be unavoidable.

terations the gulations r exhi- ion of orm signals.

The Committee have sanctioned an alteration of the regulations for the exhibition of storm signals. Hitherto it has been the rule for the signal cone to remain up until the expiration of 48 hours from the time of despatch of the warning telegram from the Office, unless a special order to lower the cone is issued. The rule was adopted, although the forecasts of the Office are restricted to 24 hours and a gale would be expected to follow the warning within that period, because a second gale sometimes follows a first within 24 hours and there might not be time to repeat the warning within that period. Under the new rule the cone is to remain up until *the evening of the day following the issue of the warning from the Office.*

The duration of the warning is thus about 24 hours for evening messages and about 36 hours for morning messages. The course of the meteorological changes is watched in the Office by means of telegraphic observations at 8 a.m., 2 p.m., and 6 p.m., and therefore there is ample opportunity for renewing the warning, if necessary, for the second gale while the cone remains hoisted. On the other hand, there will be less probability of the signal flying for a considerable period after the anticipated disturbance is past.

ffice emises.

One of the points noted in connexion with the work of the Office by Sir Herbert Maxwell's Committee was the unsuitability of the present office premises. The Committee have taken the matter into consideration and have thought it desirable to raise the question of providing accommodation for the Office in premises to be erected on land at South Kensington in possession of H.M. Office of Works or of the Commissioners for the Exhibition of 1851. Accommodation in that position would enable the Committee to exhibit some of the more important results of meteorological work to the general public and would place the Office in close proximity to the Museums of Science and Art and to the University of London. These advantages outweigh in their opinion the drawback of the additional distance from the lithographers, the City, and the docks. They hope that it may be possible to find the accommodation they require in the same building with a post office.

The Committee have learned with satisfaction that Your Lordships view this proposal with approval and are willing to bear it in mind in considering the arrangements of the buildings to be erected on the site.

lonial ervations.

With regard to other suggestions made in the Report of Sir Herbert Maxwell's Committee or elsewhere for the improvement or extension of the meteorological service, the Committee regret that they have been unable to arrange for the regular collection and publication of Colonial observations. The work of the Statistical and Library Branch is already too heavy to permit of

their undertaking further responsibility in that direction. The Director has undertaken to assist the Colonial Office by preparing suggestions for the organisation of meteorological observations and for their publication in a common form as nearly as possible in agreement with international forms.

A correspondence with reference to the proposed arrangements for compiling and publishing an annual volume of observations made in various Colonies and Dependencies is printed in Appendix I.

Marine observations.

The issue of Monthly Meteorological Charts of the Indian Ocean and the Red Sea referred to in the last Report of the Council has been authorised, and the first number will be that for May, 1906. The charts will contain the results of the discussion of the winds of the Indian Ocean which has been in progress for some years. They will also give a reproduction on reduced scale of the charts of the cyclone tracks in the South Indian Ocean, prepared by the late C. Meldrum, C.M.G., M.A., F.R.S., of Mauritius, and issued as a publication of the Office in 1891. These charts are now out of print, and a new edition on the reduced scale is in preparation. It is hoped that they may be supplemented by additional information from the Royal Alfred Observatory.

It has been arranged to supply to the Meteorological Reporter to the Government of India daily observations from the Indian Ocean as received in the Office, and it is anticipated that the number of observations available for this purpose will be augmented considerably by the issue of the Monthly Charts, which will bring the Office into communication with a number of seamen navigating that ocean.

Fishery barometers.

The Committee have received very valuable assistance from the Board of Agriculture in England, the Fishery Board for Scotland, and the Board of Agriculture and Technical Instruction for Ireland, with reference to the inspection and management of the barometers lent for the use of the seafaring communities at fishing villages and elsewhere on the coasts of the British Isles. The inquiries which have been made through the assistance of the bodies named have led to a considerable development of the organised use of the barometers for the purpose of anticipating important weather changes. The time has now arisen when a fresh edition of the Fishery Barometer Manual to be used with the barometers is called for. It is intended to include in the new edition some information with regard to gales on the British and Irish coasts which has been accumulated since the last edition of the manual was issued, and which should prove of considerable practical service.

The Committee regret that they are unable to meet all the demands for the loan of fishery barometers and at the same time to maintain those already lent in good working order and repair. They have found it necessary to limit the number which they are prepared to lend and maintain to 230.

Special researches.

Attention has been given to researches upon various subjects, and in connexion therewith a number of interesting points have been disclosed.

e history surface air rents.

The work on the trajectories of air in travelling storms by the Director and Mr. Lempfert has been completed by a study of the changes which take place in pressure, wind velocity, and temperature of the air as it moves along its trajectory, or path, on the surface. These changes have been considered especially with regard to the weather experienced at the successive positions traversed by the air, and an endeavour has been made to trace a connexion between the conditions of weather and the ascent or descent of air as indicated by the convergence or divergence of the trajectories along which the air moves from different sides.

The changes indicated in the pressure and the associated changes in the temperature of air as it moves along its path on the surface are very remarkable. They lead to important conclusions with regard to the motion of air in relation to cyclonic and anticyclonic centres and the relation of depressions and anticyclones to the ascent of air from the surface and its descent thereto.

The results of the study have been embodied in an official publication with the title of "The Life-history of Surface Air Currents." The work is divided into four parts. The first gives a general discussion of the results and summarises the conclusions to be drawn from them; the second gives the details of the surface motion of air in eight typical cases in relation to travelling storms; the third gives the results of applying similar methods to the surface motion of air over the Atlantic Ocean as deduced from the synchronous charts for 1882–83 published by the Council in 1888; while the fourth part deals with the computation of the surface trajectories of air theoretically, and consists mainly of contributions by Mr. G. T. Bennett, of Emmanuel College, Cambridge, and Mr. W. H. H. Hudson, M.A., late Professor of Mathematics at King's College, London, to whom the Committee desire to express their thanks. The final proofs were passed for press at the beginning of March, but copies had not been received by the end of the official year.

ıfort of wind .

They also desire to record their obligation to Mr. G. C. Simpson, M.Sc., 1851-Exhibition Scholar of the University of Manchester, who acted as unpaid Assistant, first to the Secretary of the Council and subsequently to the Director, until he took up his duties as Lecturer on Meteorology in the University of Manchester in the autumn of 1905.

Mr. Simpson was principally engaged upon the re-determination of the velocity equivalents of the several numbers of the scale of wind force introduced in 1805 by Admiral Sir Francis Beaufort, Hydrographer of the Navy, for estimating wind at sea. The subject engaged the attention of the Meteorological Council for some years, and the discussion was nearly completed when the Committee was constituted. To recapitulate briefly the position of the subject, it may be said that the force of the wind and the effects it produces depend upon its velocity, and consequently any consistent scale of wind force, however empirical it may be, will have certain velocities corresponding with its successive numbers. Admiral Beaufort's scale is expressed by the series of numbers 0 to 12, ranging from a calm to a hurricane "which no canvas could withstand." The specification of the scale had no

direct reference to any measurements of the velocity of the wind, for which in 1805 there were indeed no satisfactory means available. The numbers were specified by the behaviour of a well-conditioned man-of-war of that time under the various winds, for the numbers 1 to 3 by the speed of the ship, and for higher numbers by the amount of sail she could carry.

Since 1805 circumstances have changed. Sailing ships have been very generally superseded by steamers, and the rig of those that remain no longer follows the lines of Admiral Beaufort's "well-conditioned man-of-war," but the tradition of the scale has been preserved, not only in the Navy but on ships of all kinds and at shore stations as well. Thus the Beaufort numbers are in constant use in nearly all parts of the world, and yet the means of identifying the specification of any particular number has been lost. There remain the brief verbal descriptions of the winds under the headings "Light airs" or "Moderate breezes," or gales of various descriptions, with storm and hurricane for the two highest numbers, but these descriptions are too vague to furnish an actual specification. The problem therefore was to find out first the velocities of the wind which correspond with the averages of the numbers used to identify the wind force in accordance with seamen's traditional practice, and then, if possible, devise a new specification that would tend to preserve the uniformity of the tradition and support the correspondence between the numbers and the selected average velocities.

The only method of dealing with the problem is to compare the estimates of observers thoroughly practised in the nautical method of estimating the wind, at one or more stations where there is a well exposed anemometer, with records of the velocity of the wind obtained independently of the observer's estimate. This method had been employed by Mr. Scott, the late Secretary of the Council, and by others; but here another difficulty arises. The methods of determining the actual velocity of the wind from its effect upon an anemometer have been modified and developed since the introduction of the Robinson anemometer, and the effect of these modifications is to alter the wind measurements in some cases by as much as 25 per cent.

A third difficulty arises from the process of taking averages. In finding the relation between two sets of numerical quantities, when a real numerical relation exists but when each set of measurements is liable to error, as all numerical measurements are, different results are obtained by different methods of grouping for the purpose of forming averages, and the third difficulty in the problem under consideration is to decide which method of grouping must be adopted in the case of the Beaufort numbers and corresponding wind velocities to give the most appropriate results.

In a report presented to the Director, Mr. Simpson has discussed the various points and particularly the last difficulty, and he has given a very clear statement of the results. He has made use of material specially prepared in the Office for the purpose, and also of a large number of data put together by Mr. R. H. Curtis for a paper presented to the Royal Meteorological Society in 1897. The

Committee have thus been enabled to issue as an official publication a report which it is believed will give a satisfactory table of equivalents of the average velocities of the winds corresponding with the Beaufort numbers.

A very curious and interesting result is derived from the investigation. The velocities arrived at empirically as the appropriate equivalents of the Beaufort numbers were plotted upon a diagram and a working curve drawn to represent them. The curve so drawn turns out to be very nearly identical with that represented by the algebraical equation

$$V = 1{\cdot}87\ B^{\frac{3}{2}} \text{ or } B = \frac{2}{3} V^{\frac{2}{3}},$$

where B is the Beaufort number and V is the hourly wind velocity in statute miles per hour. Adopting Mr. Dines's factor ·003 for obtaining the wind pressure in pounds upon a square foot, it follows that the relation between the Beaufort numbers and the wind pressure (P) is expressed by the comparatively simple relation

$$P = {\cdot}0105\ B^3.$$

Thus, if all the steps in this intricate investigation have been accurately followed, there appears to be underlying Admiral Beaufort's original specification the simple relation that the numbers selected are proportional to the cube root of the wind pressure.

The diagram (Plate I.) representing these relations has been plotted on paper divided according to a logarithmic scale (similar to the scale of an ordinary slide rule).

On such a diagram a straight line represents a relation between two quantities according to some simple power of one of them. The slope of the line indicates the power. Thus, if the slope is 3 to 1 as is the case with the red line, a cubic relation is indicated; if the slope is 3 to 2 as with the black line, a semi-cubical relation is shown.

Without entering into details, the fact that the straight line with the slope of 3 to 1 runs so close to all the points representing wind pressure for the various Beaufort numbers is good evidence that the Beaufort numbers may be related to the corresponding pressures by the cubic law $P = {\cdot}0105\ B^3$, and the similar correspondence for the Beaufort numbers and wind velocity with a straight line of slope 3 to 2, as shown by the black line, is equally in favour of representing the relation between the Beaufort numbers and wind velocity by the formula

$$B = \frac{2}{3} \sqrt[3]{V^2}$$

Of the points which are off the straight lines those for forces 1 and 2 are most conspicuous, for these a slight adjustment of the values within the limits of error of observation would bring them on to the line.

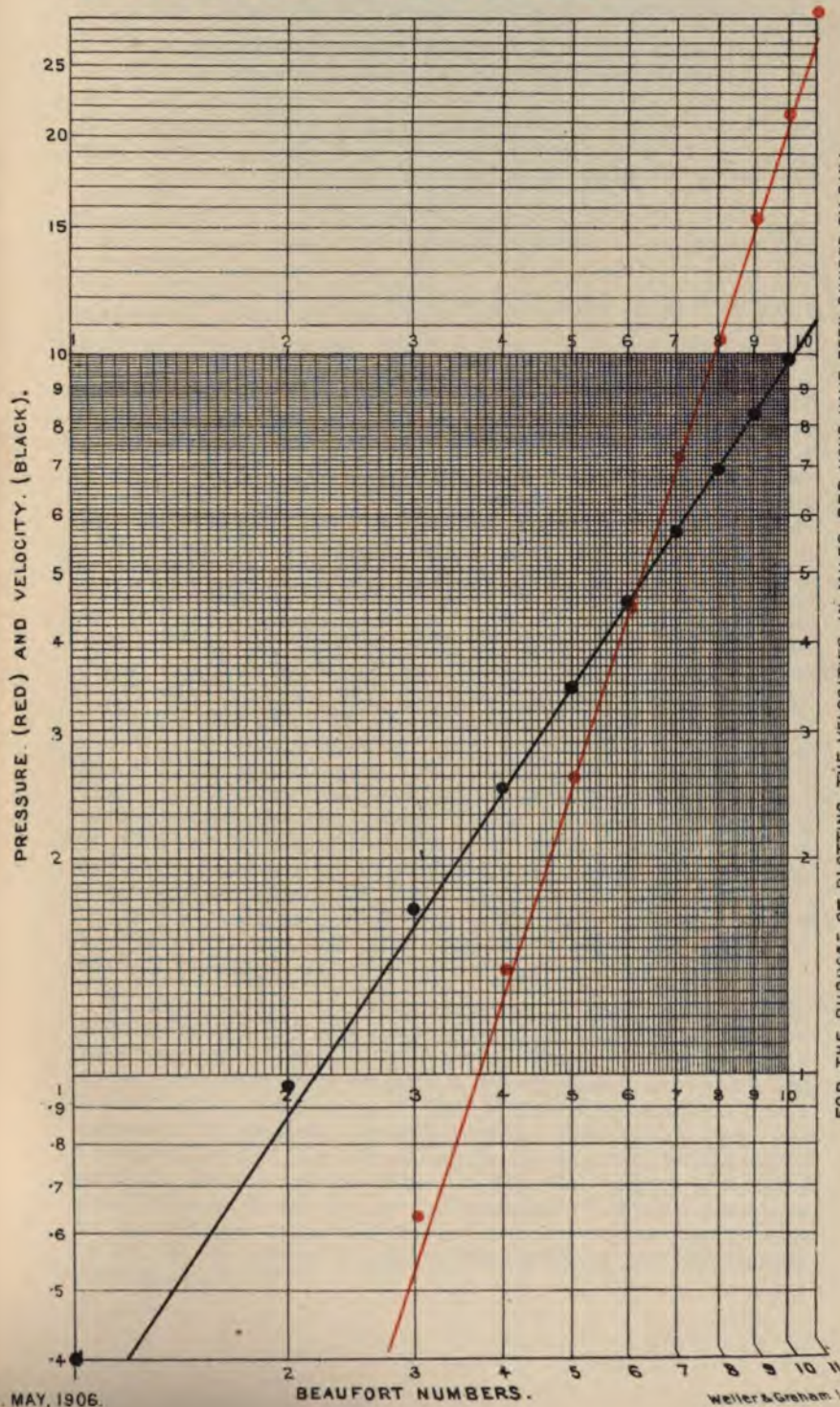
The remarkable fidelity with which the cubic curve represents the relation indicated by the empirical numbers is shown in the

To face p. 18.

ADMIRAL BEAUFORT'S NUMBERS FOR WIND FORCE & THEIR EQUIVALENTS.

RESULTS PLOTTED ON LOGARITHMIC SCALE.

THE BLACK DOTS SHOW THE VELOCITY FOR EACH OF THE BEAUFORT NUMBERS TAKEN FROM THE BLACK CURVE OF THE ORIGINAL DIAGRAM
THE BLACK LINE REPRESENTS VARIATION PROPORTIONAL TO $B^{\frac{3}{2}}$.
THE RED DOTS SHOW THE PRESSURE FOR EACH OF THE BEAUFORT NUMBERS TAKEN FROM THE ORIGINAL DIAGRAM
THE RED LINE REPRESENTS A VARIATION PROPORTIONAL TO B^3


PRESSURE. (RED) AND VELOCITY. (BLACK).
BEAUFORT NUMBERS.
FOR THE PURPOSE OF PLOTTING, THE VELOCITIES IN MILES PER HOUR HAVE BEEN DIVIDED BY SIX:
AND THE PRESSURES IN POUNDS PER SQUARE FOOT MULTIPLIED BY TWO.

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diagram, in which the red dots represent the velocities as taken from the empirical working curve, and the red straight line represents the algebraical relation $P = \cdot 0105\ B^3$. It will be noticed that it touches 7 out of the 9 dots representing the empirical relation.

The results deduced from this representation of the relation between the Beaufort numbers and the mean hourly velocity are as follows :—

Beaufort number... ...	0	1	2	3	4	5	6	7	8	9	10	11	12
Mean hourly wind velocity in statute miles per hour	0	2	5	10	15	21	27	35	42	50	59	68	above 75
Corresponding wind pressure in pounds per square foot	0	·01	·08	·28	·67	1·3	2·3	3·6	5·4	7·7	10·5	14·0	above 17

The simplicity of the relation between wind pressure and the Beaufort numbers suggests that there is something about the working of a sailing ship which depends upon the cube root of the wind force. It is known that the speed of a steam vessel depends upon the cube root of the power used to drive her, and the occurrence of the cube root in both these relations suggests an examination of the average relation between the speed of a sailing ship and the velocity of the wind. For the purpose of such an investigation Admiral Sir J. Dalrymple Hay, G.C.B., F.R.S., has been kind enough to lend a log kept by him on H.M.S. "Wolverine," 60 years ago, from which the speeds and wind estimates have been extracted. Taking the average speed for all points of sailing, it appears that up to force "7" the ship's speed was roughly proportional to the wind velocity, making 9 knots at that force. For higher forces the speed increases very little. Captain Creak, C.B., F.R.S., supplied a selection of observations from his log on board H.M.S. "Juno," in which the ship's speed running before high winds is given. In that case, roughly speaking, the proportionality between speed and wind force is carried to the higher forces, with a speed of 10·5 knots for force 10. There are obviously many circumstances which would interfere with any strict law of proportionality, and no doubt each ship would have its own curve of relation between speed and wind velocity depending upon her build and rig, but the results of the comparison are sufficiently instructive to enable the Committee to say that a study of the effect of wind upon the speed both of steamships and sailing ships promises to yield interesting and valuable results.

Mr. Simpson in his report develops a specification of the numbers of the Beaufort scale suitable for land stations and for coast uses. It is difficult to draw up a specification of all the separate numbers which shall be at once applicable on ocean going vessels using steam or sail. The Marine Superintendent in a memorandum suggests a grouping of the Beaufort numbers and a means of identifying certain points of the scale for the use of seamen. This is printed with the Director's Report, and with a note by Sir G. H. Darwin on the processes of obtaining averages for the velocity equivalents of the Beaufort numbers, and another by Mr. W. H. Dines, F.R.S., on the factor of the Kew pattern anemometer.

ld of
at.

In the Report of the Council for 1904–5 reference was made in a remarkable reversal of the divergence from average of the yield of wheat per acre for the Eastern Counties of England, with reference to the epoch 1895–6, which was noticed in connexion with a paper communicated to the Royal Statistical Society. It was suggested that the relation "appears to indicate that the fluctuations in the yield of wheat can be represented by the sum of a series of periodic fluctuations, and that the curves for a number of these component periodic fluctuations have a common nodal point in the interval 1895–6." This subject has been pursued further with very remarkable results. On taking the average of consecutive years the curve of variation of the wheat crop becomes very much simplified, and the simplified curve for the interval 1885–1904 can be represented with a remarkable degree of accuracy by the corresponding points on a curve formed by the combination of the following pure sine-curve variations :—

11	years	period	with	an amplitude of	+ 2·8	(bushels per acre).
$\frac{11}{2}$	"	"	"		+ 0·4	" "
$\frac{11}{3}$	"	"	"		− 1·2	" "
$\frac{11}{4}$	"	"	"		+ 1·2	" "

All these components concur in a node in 1895–6. The node is an ascending node for all but the third.

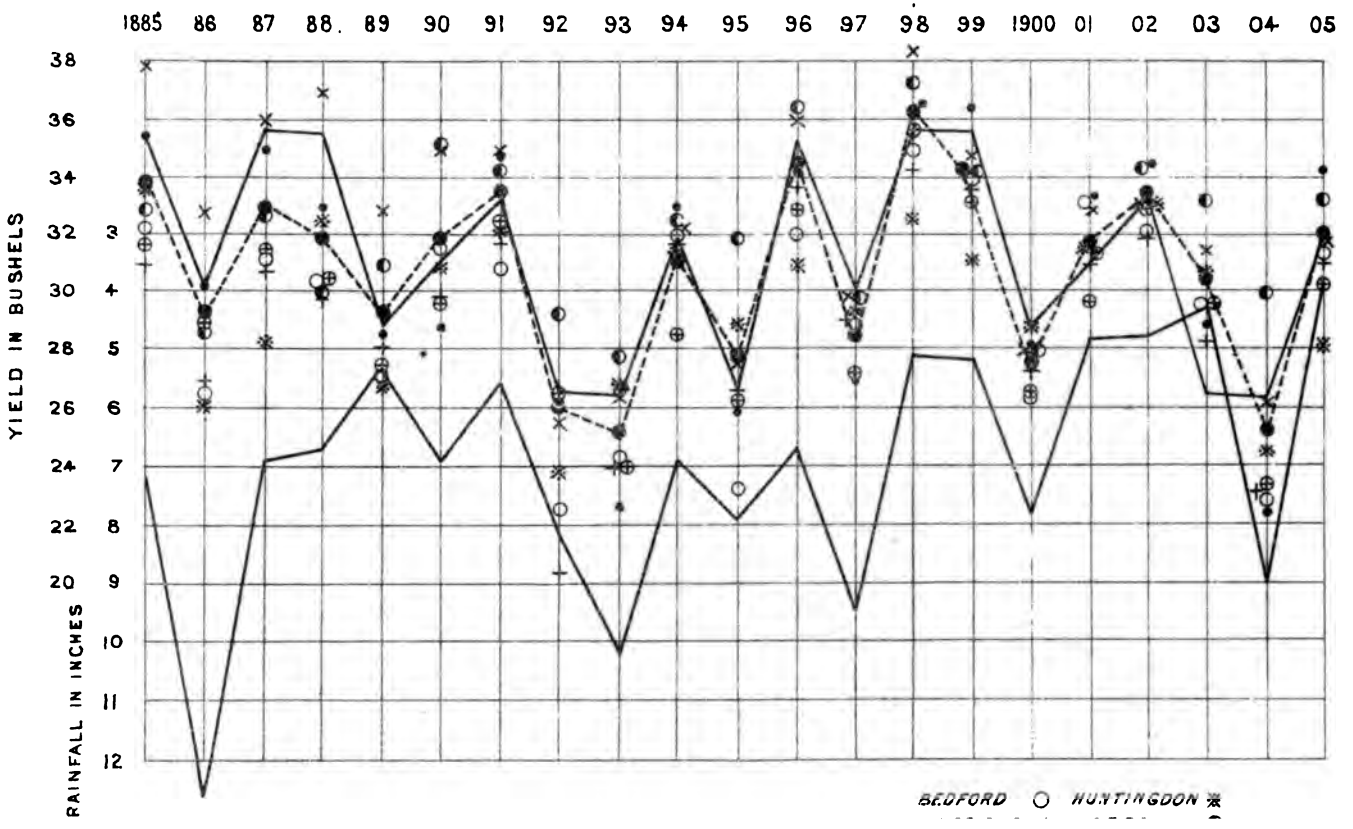
When the examination of the curve was begun it was supposed that the periodicity indicated by the reversal with regard to 1895–6 was made up of components without any harmonic relation to one another, and there was then no idea of a variation of 11 years period as a fundamental one. The numerical manipulation of the values showed however that there was a variation with an 11 years period, and when that was taken out it was found impossible to discriminate between the residual variation and the combination of two variations forming the third and fourth harmonic components of an 11 years period. The representation by an 11 years curve with its harmonic components was therefore accepted, and a paper pointing out this representation of the curve for wheat yield and its relation to the figures for the previous autumn rainfall was contributed to a volume in course of preparation by the Meteorological Societies of Austria and Germany as a memorial of Professor Hann's long connexion as Editor with the "Meteorologische Zeitschrift." There remained the fluctuation which had been smoothed out by taking the averages of consecutive years. It seemed probable that this fluctuation, which may be called in a somewhat vague sense a fluctuation with a two-year period, was really a combination of the fifth and sixth components of the fundamental 11-year period. These two components would have periods of eleven-fifths of a year and eleven-sixths of a year respectively, of which one is a little more than two years and the other a little less. In order to bring these into

YIELD OF WHEAT FOR EASTERN ENGLAND.

THE DOTTED LINE SHOWS THE ACTUAL AVERAGE YIELD FOR THE SEVEN COUNTIES NAMED BELOW

THE UPPER FULL LINE SHOWS YIELDS COMPUTED FROM THE HARMONIC COMPONENTS { PERIOD 11 11/2 11/3 11/4 11/5 11/6 ; AMPLITUDE 2·9 0·5 1·8 2·8 1·0 1·0

THE LOWER FULL LINE SHOWS THE RAINFALL (INVERTED SCALE) FOR THE PREVIOUS AUTUMN OF EACH YEAR



To face p. 37.

account it was necessary to compute the magnitudes of the first four components in the original curve from those obtained for the smoothed curve. This was done, and when these components were removed from the original curves the residuals were examined for the magnitudes of the fifth and sixth components. Minute accuracy is out of the question, but components with an amplitude of one bushel per acre and more were selected, again with a node at 1895-6, and the six components were employed. The result represents the fluctuations of the yield of wheat for the 21 years 1885–1905 in a very remarkable way, as will be understood from the diagram, plate II., in which the full line represents the actual yield and the dotted line the computed yield. The direction of change from year to year is represented in every case, and only in 1887, 1888, and 1896 are the residual differences between the actual yield and the computed yield really considerable. When these curves were constructed the yield for 1905 was unknown. The computed value, equal to that for 1894, was 31·9 bushels per acre: the actual yield as determined from the returns of the Board of Agriculture which have been issued since that time, is 32·0, so that the agreement is remarkably close. The component curves from which the computed yield is compiled have the following amplitudes:—

Period ...	11	$\frac{11}{2}$	$\frac{11}{3}$	$\frac{11}{4}$	$\frac{11}{5}$	$\frac{11}{6}$ years.
Amplitude	+ 2·9	+ 0·5	− 1·8	+ 2·8	+ 1·0	+ 1·0

Each component curve starts from a node at 1895–6.

The determination of the amplitudes of the components which proceeded partly from the numerical manipulation of the values, and partly from the inspection of the original and residual curves, is an unconventional process, but it has some advantages over the method of dealing with the values by numerical process alone. For the latter method it is necessary to assume a knowledge of the fundamental period, which in this case might be taken as 11 years. The calculation of the components then proceeds by the arithmetical manipulation of the 12 values; the calculation of the components of smaller periods depends upon very few numbers and the result is liable to serious disturbance by incidental errors from which the original numbers cannot be supposed to be entirely free. In order to deal with the figures in accordance with more conventional methods, Mr. H. E. Wood analysed the curve harmonically, using the period 1891 1902 as the fundamental one. His values for the amplitudes are + 2·74, + 0·76, − 2·68, + 2·54 + 2·04, + 2·04. The nodes of all the components are not quite coincident. There are clearly some differences between these figures and those given above; his resultant curve is not so closely in agreement with the actual values as that obtained by the less regular method. His computed value for 1905 is 32·8 bushels per acre.

It is scarcely possible that the agreement between the calculated and the actual figures is fortuitous. It is true that any combination of 12 consecutive yearly values can be analysed into an 11-years periodic term with harmonic components, but that

the resultant curve so computed should be in reasonable agreement with the actual values for another 9 years some on either side of the original 12 selected, is beyond the probability of accident.

Mr. Wood also calculated the periodogram, according to Professor Schuster's method, for the 20 years, which gives indications, though not very prominent ones, of the existence of periodicities of 11 years and its sub-periods. A curious point in the periodogram is that a periodic variation of two years period is conspicuously absent. Its amplitude is shown as zero. In other words on the average of the 20 years the odd years and the even years are equally favourable. The original curve shows such marked fluctuations from one year to another that this result was at first surprising, but on further examination it is clear that it is precisely what is to be expected if the apparent two-year fluctuation is really the result of a combination of two equal periodic variations of $\frac{11}{5}$ years and $\frac{11}{6}$ years period respectively. The two-year oscillation changes its phase in the course of the 20 years in such a way that the large oscillations in one part are the exact opposite of the similarly large oscillations of another part, and the net result for the whole interval is zero. Thus the disappearance of the two-year oscillation from the periodogram is a striking confirmation of the view that it results from the combination of two components of the fundamental 11-year period, each with a period of nearly two years.

Forecast district inquiry.

The inquiry into the weather characteristics experienced at individual stations with different types of pressure distribution, to which reference was made in the last annual report, has been continued upon broader lines. The daily observations made at the 27 Telegraphic Reporting Stations, and at the Second Order Stations (31 in number) furnishing reports for use in connexion with the Weekly Weather Report have been extracted and classified in accordance with the various types, and have also been arranged in periods. The types selected have been similar to those employed in the earlier inquiry. The periods of time, each of 6 or 7 weeks in duration, have been grouped round the solstices or equinoxes, or round the intermediate divisions of time. The systematic classification of weather changes has long been desired, and the inquiry now in progress is likely to yield results of considerable value.

St. Helena wind records.

The recording part of the anemometer at St. Helena which was out of order has been repaired and re-erected. The traces now being received are more satisfactory than any that have previously come from the island. Not much progress has been made with the preparation of the report on the meteorology of the Colony, but in the course of the year a comparison of the yearly wind velocities seemed to suggest that exceptional strength in the South-East trade wind at St. Helena was in some way associated with exceptional rainfall in England. The conclusion is not an unreasonable one, although the two countries are very remote and the Equator with its belt of calms is between them, so that the direct transference of air between the two is unlikely. An

increase in the strength of the trade wind may, however, be regarded as an increase in the activity of the general atmospheric circulation and is therefore quite likely to indicate a general increase in the intensity of meteorological phenomena in the various parts of the general circulation. It cannot be regarded as a merely local phenomenon without incidental consequences in other parts of the world, although the consequences are not yet known. Further inquiry disclosed other illustrations of a possible relationship between the St. Helena wind strength and rainfall in England, in particular a close parallelism between the average seasonal march of the velocity of the trade wind and the average rainfall in England south.

A short paper on the subject pointing out these curious correspondences was communicated to "Nature," and has attracted a good deal of attention. The subject was dealt with by Professor J. Hann, of Vienna, in the "Meteorologische Zeitschrift" for February of this year. While no final conclusions can be drawn from the correspondences cited, they are of sufficient interest and importance to indicate the advantage, and even the necessity, of taking up the discussion of meteorological subjects from the wider point of view of the general atmospheric circulation and the desirability of promoting the organisation of regular meteorological observations at points in the Northern Hemisphere and elsewhere, which, like St. Helena in the Southern Hemisphere, are in specially favourable positions for the study of the fluctuations in the general circulation.

Instructions for observers.

Mr. Lempfert has completed the text of a new and abbreviated edition of the instructions for the use of meteorological instruments which is urgently required. The illustrations have to be prepared, and the work may then be sent to the press.

International Conference.

An International Conference of Directors of Meteorological Institutes and Observatories was held at Innsbruck in September, 1905. It was attended by representatives of meteorological establishments from nearly every part of the world. The Director attended as the representative of the Committee. About 40 questions concerning the organisation of international co-operation for official work and for research were discussed. A report of the proceedings will be published in due course. The most important topics so far as this country is concerned were those of wireless telegraphic reports for daily weather work, the investigation of line squalls, the reduction of barometric readings to sea-level, and the comparison of the standard barometers of the meteorological institutes of the various countries. The Director undertook to report upon the facilities afforded by the installation of wireless telgraphic apparatus upon ocean liners for extending the area of observation for the daily maps issued in North-West Europe, and the necessary cost of the messages. He also arranged to take part, with Professor Hildebrandsson and M. Durand Gréville, in the investigation of the special phenomena of line squalls, on the initiative of the last-named gentleman. The work is very closely associated with that upon the "Life History of Surface Air-Currents" already mentioned, and, in fact, the eighth selected

example in the published work affords a very fine example of the sudden changes in the meteorological conditions which in one form or another are characteristic of the passage of line squalls over a district. M. Durand Gréville has given reasons for hoping that the investigation of these phenomena will lead to much greater precision in forecasting the incidence of thunder showers and similar phenomena. He has already achieved considerable success in that direction.

Educational. A series of ten open meetings for the discussion of important contributions to meteorological literature, chiefly papers which have appeared in foreign periodical publications, was held at the Office in the course of the winter months. The meetings were well attended. Among those who took part in the discussions, in addition to members of the office staff, were Mr. W. W. Bryant of the Royal Observatory; Dr. Chree, of Kew Observatory; Captain E. W. Creak, C.B., F.R.S.; Mr. W. Ellis, F.R S.; Dr. W. J. S. Lockyer of the Solar Physics Observatory; Mr. E. W. Maunder of the Royal Observatory; Mr. Marriott of the Royal Meteorological Society; Dr. H. R. Mill, Director of the British Rainfall Organisation; Mr. S. Skinner of the South-Western Polytechnic; Captain A. Thompson, C.B., of the Trinity House; Professor D'Arcy Thompson, C.B., North Sea Fishery Investigation; and Mr. H. E. Wood of Manchester University.

The Director, in accordance with an arrangement of long standing, gave a course of three lectures at the Cavendish Laboratory in the University of Cambridge in February. The subject of the lectures for the year was the "Life History of Surface Air-Currents." He has also undertaken to give a course of four lectures in the University of London, in the Month of May, on the "Atmospheric Circulation and its Relation to Weather."

The Committee have not seen their way to continue the offer of prizes for competition among the cadets of H.M.S. "Conway" and H.M.S. "Worcester," as a charge upon the funds of the Office. It is understood that the Director will himself take steps for the encouragement of the study of meteorology in those important institutions for the training of officers for the mercantile marine.

A number of applications have been received from time to time for charts for class use.

At the request of the Secretary of State for the Colonies the Director undertook the selection of a suitable candidate for appointment as Chief Assistant in the Meteorological Department of the Transvaal, and recommended Mr. H. E. Wood, M.Sc., Demonstrator and Lecturer in the Physical Laboratory of the University of Manchester, for the post. Mr. Wood subsequently attended at the Office for three months training before proceeding to take up his duties in South Africa.

By arrangement with the Colonial Office also, Mr. E. W. Davy undertook a short course of training as meteorological observer before taking up his appointment as Forester in the British Central African Service.

With the sanction of the India Office permission has been given for Mr. P. H. Dutt, of the Indian Educational Service and of Christ's College, Cambridge, to work in the Office for three months as a volunteer assistant.

Magnetic observations at Valencia have been continued in co-operation with the magnetic work of the National Physical Laboratory, at the request of a Committee of the Royal Dublin Society, consisting of Lord Rosse and Professor J. Joly. **Magnetic observations at Valencia.**

The Committee desire to acknowledge the co-operation with the Office of a large number of public departments, local authorities, and private observers. **Acknowledgments.**

They desire to refer specially to the valuable daily reports received from the Azores through the courtesy of Major Chaves, the Portuguese Government, and the Commercial Cable Company.

To the Eastern Telegraph Company also special acknowledgment is due for the transmission of reports from the Azores and the Spanish Peninsula, and to the Great Northern Telegraph Company for the free transmission of all cable messages between this country and the Scandinavian kingdoms.

The names of local authorities and private observers on sea and land who contribute observations are printed in the Appendices.

No change took place in the Office staff in the course of the year except that Mr. Lempfert, who has been employed for some years as private Assistant to the Secretary of the Council, took up temporarily the duties of Superintendent of Instruments. At the close of the year, however, various changes have been arranged. **Office Staff.**

Mr. J. S. Harding, who has been connected with the Office since its commencement under Admiral FitzRoy in 1854, who was Private Secretary to Admiral FitzRoy, and for the past 32 years Chief Clerk and Cashier, retires on pension in accordance with the arrangements made by the Council. The Committee feel entitled to record not only their own appreciation but that of the Council for the services rendered by Mr. Harding during a full half-century. His retirement and the changes in the constitution of the governing body, furnish an occasion for various changes in the arrangement of the Office staff, which are indicated on pp. 7, 55.

The staff of the Office is divided into six branches. The branches co-operate as may be required in the various scientific investigations indicated above. The work of a routine character which is assigned to the several branches will be referred to under the following headings:—

I. THE MARINE BRANCH, which deals with ocean meteorology—the collection, tabulation and discussion of meteorological data for all parts of the ocean traversed by British ships; the preparation and issue of charts or other publications exhibiting the results obtained from the discussion of the observations.

II. THE TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH, which takes charge of the collection of daily telegraphic reports from stations in the United Kingdom, the Azores, and the Continent of Europe, and the preparation of reports, charts, forecasts, and storm warnings based upon them.

III. THE STATISTICS AND LIBRARY BRANCH, which deals with (*a*) the climatology of the British Isles, and takes charge of (*b*) meteorological information and statistics regarding British Colonies and Dependencies, and Foreign Countries. This branch also deals with (*c*) the distribution of meteorological reports and publications, with (*d*) inquiries from all sources upon meteorological questions, not specifically assigned to one of the other branches, and (*e*) with the arrangement of the Library.

IV. THE OBSERVATORY BRANCH, which deals with the automatic registers received from self-recording instruments of all kinds at observatories and other stations in connexion with the Office.

V. THE INSTRUMENTS BRANCH, which deals with questions arising out of the supply of meteorological instruments for the Navy, observers on ships of mercantile marine, Colonial Governments, and the stations of various kinds in connexion with the Office.

VI. CORRESPONDENCE AND ACCOUNTS BRANCH, which deals with finance, the arrangement of correspondence, and the registration of documents.

The general method of dealing with the information which is regularly collected by the Office is indicated in Appendix II. No important change has been made in the arrangements during the past year. Some details of the year's work of the several branches are given in the following notes.

I.—MARINE BRANCH.

ollection of nformation.

The arrangements for the systematic collection of data with respect to the meteorology of the ocean from the Royal Navy and the Mercantile Marine have been continued as heretofore. An indication of the system adopted is given in Appendix II.

nformation oceived.

The meteorological observations made on board H.M. ships are reported to the Admiralty.

A large number of ships' logs have been lent to the Council by the Admiralty for the purpose of extracting the meteorological data relating to the Indian Ocean.

The meteorological registers of all kinds, other than those from lighthouses, received by the Office during the year from Officers of the Navy or from the Mercantile Marine numbered 2,221. A list is given in Appendix IV.

Of the meteorological logs, 159 have been classed as "excellent" or "very good," as compared with 160 of the previous year.

The following list shows the number of contributions relevant to the different lines of route :—

North Atlantic	95	Eastern, viâ Suez Canal...	43
Baltic	3	Far Eastern, viâ Cape of Good Hope	39
Mediterranean	34	Far Eastern, viâ Suez Canal	27
South America (East Coast)	22	Pacific	40
„ „ (West „)	6	North Polar	4
South Africa	18		
Eastern, viâ Cape of Good Hope	16		

Appendix III. (p. 103) contains a list of the observers who, during the past year, have contributed logs classed as "excellent." Several of these observers have co-operated with the Office for many years. The names which appear in the list for the first time are as follows :—

Observer's Name.	Ship.
Castle, E. W.	S.S. "Miami."
Ellis, A. E....	S.S. "Alabama."
Falla, J. F.	S.S. "Gladiator."
Heron, A.	S.S. "Alva."
MacIntosh, C. F.	S.S. "Clan Ranald."
Mayoss, F., Lieut., R.N.R. ...	S.S. "Ruapehu."
McKellar, A. W., Lieut., R.N.R.	S.S. "Tongariro."
Monro, Comdr. C. E., R.N. ...	H.M.S. "Rambler."
Neale, H. H.	S.S. "Manistee."
Reside, D.	S.S. "Miami."
Robertson, J., Sub-Lieut., R.N.R.	S.S. "Goorkha."
Scudamore, J. H. H., Sub-Lieut., R.N.R.	S.S. "Manistee."
Sumner, H. N.	S.S. "Clan Colquhoun."
Tait, T. A....	S.S. "Wellington."
Weston. T. S.	S.S. "Papanui."
White-Parsons, V.	S.S. "Wakanui."

Recognition of "excellent" observers.

As a mark of recognition of valuable co-operation, the Council have presented various publications of the Office to observers who have returned well-kept logs.

Obituary.

The Committee note with regret the death of eight marine observers for the Office :—Captain H. Sibery, of S.S. "Clan Cameron," in July, 1905; Captain J. Wiggins, F.R.G.S., of S.S. "Diana," in September, 1905; Captain R. C. Keys, of S.S. "Sicily," in September, 1905; Captain W. R. Cato, Hon. Lieut. R.N.R., of S.S. "Scotia," in November, 1905; Captain H. Scougall, of barque "Closeburn," in December, 1905; Captain Sir Digby Murray, Professional Member of the Board of Trade, Conservator of the Thames, of S.S. "Baltic," in January, 1906; Captain Wm. Greenwood, F.R.A.S., of ship "Gareloch," in February, 1906; and Captain R. W. Trenaman, of S.S. "Romney," in February, 1906.

Supplementary Information.

The arrangements for obtaining meteorological registers from the captains and officers of ocean-going ships who use their own instruments, have been continued, and a large amount of

information has thereby been collected, which is immediately utilised in the Monthly Pilot Charts of the North Atlantic and Mediterranean. The arrangements are indicated in Appendix IV., pp. 117–123.

Use of Information received.

Charts of the distribution of the temperature of the surface water of the Atlantic for successive months have been compiled for insertion in the Pilot Charts for the North Atlantic and Mediterranean as in the previous year. The maps thus prepared are issued within six weeks of the close of the month in which the observations are taken. For each of the months recently dealt with the number of observations tabulated extends to some 4,000.

Daily Charts of pressure over the North Atlantic showing the distribution of isobars were also prepared in the department until the end of May, 1905, in order to obtain the mean pressure values for the month. The monthly results for pressure are shown on the sea temperature charts, and the daily charts are occasionally reproduced to illustrate any prominent meteorological occurrence which has been noted.

For the discussion of the weather over the ocean south of 30° S. Lat., in connexion with recent Antarctic exploration, there were tabulated about 6,000 sets of observations, making in all 25,000, from ships taken at Greenwich Mean Noon, and about 6,700, making in all 13,700, from shore stations. Of these, about 6,500 and 3,400 sets respectively, have been plotted in geographical position on the working charts, making in all a total of 18,500 ships observations and 9,400 shore observations.

Besides continuing the issue of the Monthly Pilot Charts and the examination of all logs and documents received, the marine department of the Office has been engaged upon the discussion of the meteorological data for the Indian Ocean, extending to 30° S.

Information supplied for the Admiralty.

Climatological tables have been compiled for various places in the Gulf of St. Lawrence, British Columbia, West Africa, and South Australia at the request of the Admiralty.

Hydrographic notices have been extracted from the meteorological logs and forwarded to the Admiralty. Among those sent during the year were soundings by Captain F. J. Bayldon, Sub-Lieut. R.N.R., S.S. "Induna," in the South Pacific Ocean.

II.—Forecast and Storm Warning Branch.

Daily Weather Reports.

The arrangements for the issue of the Daily Weather Report and Forecasts, and for the preparation of information for publication in the newspapers have remained the same as in previous years.

Telegraphic reporting stations.

The stations from which telegraphic reports are received are shown in the lists given on pp. 72–92, and on the Map (Plate V.).

During the year several changes have taken place in the corps of observers at telegraphic reporting stations. At Donaghadee Mr. R. Damerell has succeeded Mr. J. Mahoney; at Dungeness Mr. W. Pender has been relieved by Mr. W. C. Lewis; at Portland Bill Mr. W. J. Batton retired and was succeeded by Mr. W. H. Taylor, and at Spurn Head Mr. A. S. Badcock succeeded Mr. W. Y. Counter on June 26th, 1905.

Inspection of the Stations

The stations indicated in the list in Appendix II., pp. 72–91 have been inspected during the year. The Reports of the Inspectors show that efficiency has been maintained.

Discussion of Information.

A detailed account of the manner in which the meteorological information received by telegraph is utilised for the preparation of the Daily Weather Report is given in Appendix II. The Supplementary Chart IV., on page 2 of the Report, is still employed daily in illustration of the district values published in the Weekly Weather Report of the preceding week.

The information as to the weather in the British Islands has been supplemented by postal and telegraphic reports sent daily by volunteer observers. These details have proved a useful addition to the telegraphic reports of the first page.

Display of Weather Information.

The substance of the morning and afternoon reports received by telegraph as to the state of the weather at certain stations on the English and Welsh coasts, has been displayed on the balcony of the Office at 63, Victoria Street, S.W. Charts have been suspended in the portico of the street door exhibiting the latest information received from various portions of Western Europe, and the latest forecasts and storm warnings that have been issued. Similar information has also been posted up on a notice board close to the meteorological station in St. James's Park.

Weather Forecasts.

The means adopted for the distribution of the forecasts drawn up in the Office have been continued during the past year. They are detailed in Appendix II., pp. 56–59.

Copies of the 11 a.m. forecasts, based on the 8 a.m. observations, have been regularly called for by messengers from newspapers or news agencies, and printed or typed copies have been delivered, either by hand or through the post, to subscribers, and distributed for exhibition as follows: in the City, at the Mansion House, Lloyd's Rooms, Messrs. R. & J. Beck's, Cornhill, Messrs. Hawes, 79, Leadenhall Street, and Messrs. Watson, 313, High Holborn; in the West End, in the Libraries of the House of Lords and the House of Commons; at Messrs. Elliott's, Leicester Square; Messrs. Stanford's, Charing Cross; Messrs. Negretti & Zambra's, Regent Street; Messrs. Hawes, 49, New Cavendish Street; Messrs. Webster Bros., 4, Porchester Road, W.; and at various Clubs.

Forecasts for H.M. Ships.

Forecasts have been supplied occasionally to His Majesty's Yacht as requested by the Commodore. At the request of the Admiralty, forecasts for the S.W. of England and the Bay of Biscay have

been regularly supplied to the Commander-in-Chief, Devonport. Arrangement has also been made with the Admiralty for the supply of forecasts to a number of H.M. ships as occasion requires.

arvest recasts.

During the summer months the special service of afternoon forecasts for the benefit of agriculturists and others was arranged as in previous years, and special telegraphic reports of observations at 2 p.m. were obtained for this purpose. These forecasts are sent by telegraph at 3.30 p.m. to those who express a wish to receive them regularly, and who defray the cost of the telegrams.

In the course of the four months, June to September, the forecasts were sent, for varying periods of time, to 43 individuals, as compared with 39 in the preceding year.

Of these 43 recipients :—

5 received forecasts for District 3 (England, E.), 8 for District 4 (Midland Counties), 16 for District 5 (England, S.), 5 for District 6 (Scotland, W.), 4 for District 7 (England, N.W.), 3 for District 8 (England, S.W.), 1 for District 9 (Ireland, N.), and 1 for District 10 (Ireland, S.).

No applications were received from District 0 (Scotland, N.), District 1 (Scotland, E,), or District 2 (England, N.E.). As regards District 6 (Scotland, W.), a portion of the country recently unrepresented in this service, an application was received last year from the Earl of Galloway for the dispatch of the forecasts to five different centres.

In 19 places out of the total of 43 to which the forecasts were sent the telegrams were required only for a limited time, *i.e.* during the progress of the hay or corn harvest. In 17 cases they were received during the entire period covered by both, while in 7 cases they were required for the whole four months.

The special Saturday evening forecasts, giving a general idea of the weather anticipated during the whole of the two succeeding days, were in increased demand ; 17 of the 43 recipients applied for these special forecasts *in lieu* of the ordinary Saturday afternoon forecasts, while 12 applied for the special forecasts to be sent *in addition* to the ordinary ones. In response to an application from Captain Hobart, of Shipley Place, Horsham, special 48 hour forecasts for agricultural purposes were also sent each morning to that locality for a period of four weeks, commencing with June 19.

Returns, giving a daily record of the weather actually experienced during the time the forecasts were sent were received from 20 persons, representing five districts of the eight included in the year's service. The results of a comparison made in the Office between the forecasts issued and the subsequent weather, as entered on these returns, shows that for the country generally 51 per cent. of the forecasts were completely successful, and 38 per cent. partially so, giving a total of 89 per cent. of forecasts which may be regarded as sufficiently correct to have been of practical value to the agriculturist. 10 per cent. were, upon the other hand, classed as partial failures, and 1 per cent. as complete

failures. Owing, in all probability, to the absence of any settled type of weather in the latter half of the summer, the result is scarcely so favourable as in 1904, when the combined percentage of complete and partial successes was as high as 92. As compared with the previous year the percentage of complete successes showed a decline from 58 to 51, but the percentage of partial successes increased from 34 to 38. The general result of the year's service compared favourably with that for 1903, and was in almost complete agreement with that for 1902.

Of the five districts from which returns were received the best result was attained in England, E., where 55 per cent. of the forecasts were completely successful, and 36 per cent. partially so. Next to England, E. the highest proportion of success was reached in England, S., where 50 per cent. of the forecasts were completely successful, and 40 per cent. partially so. At the one station in Ireland, S., to which the forecasts were sent, and from which returns were received, only 39 per cent. were completely successful, but 50 per cent. were partially so.

Testimony as to the practical value of the forecasts was borne by Mr. T. G. Binney, of Tolleshunt D'Arcy (England, E.), who wrote: "The forecasts have saved me leaving stacks open several times"; and by Mr. Jesse Norris, of Staplehurst (England, S.), who wrote: "I thank you for the correctness of the telegram weather forecasts. I have found them most useful in my farm work. Many times there has been all the appearance of a wet day, and the telegram said fine, and it turned out to be so."

Telegraphic inquiries for forecasts.

The number of inquiries for forecasts by telegraph was 184.

Transcripts of observations.

Special charts, transcripts of observations, or summaries, have been supplied to various newspapers, as in previous years.

Results of Forecasts.

A comparison for the year of the Forecasts for the United Kingdom issued at 8.30 p.m., with the subsequent weather actually experienced, is given below. The complete success, partial success, partial failure, and complete failure of the forecast as regards both wind and weather, are estimated according to definite rules which are designed to eliminate bias as far as possible.

The term "partial success" is applied to cases in which more than half the details included in the forecast are justified by subsequent events. With regard to *wind* the details comprise direction and force, and anticipated changes in either particular. With regard to *weather* they comprise temperature, the state of the sky (clear, cloudy, or overcast), and the probability of rain, snow, fog, thunder, &c., with occasional indications as to the duration or intensity of any or all of the phenomena mentioned. The term "partial failure" is applied in a similar way to a forecast in which more than half the details given are incorrect.

The detailed comparison of the forecasts with actuality for the year 1905 has been summarised to give results, (1) for the various months, and for the United Kingdom as a whole, and (2) for the various districts, and for the year as a whole.

SUMMARY of RESULTS of 8.30 p.m. FORECASTS in 1905.

(*a.*) *Results for the various Months.*

Months.	Percentages.												
	Complete Success.			Partial Success.			Partial Failure.			Complete Failure.			Sum of Successes, Complete and Partial.
	Wind.	Weather.	Average.	Wind.	Weather.	Average.	Wind.	Weather.	Average.	Wind.	Weather.	Average.	
January ...	51	65	58	34	30	32	14	4	9	1	1	1	90
February ...	51	63	57	31	32	32	17	4	10	1	1	1	89
March ...	33	66	50	45	28	36	20	5	13	2	1	1	86
April	41	63	52	33	29	31	21	6	14	5	2	3	83
May	55	61	58	33	34	34	10	5	7	2	0	1	92
June	63	63	63	28	30	29	8	6	7	1	1	1	92
July	56	54	55	31	34	33	11	10	10	2	2	2	88
August ...	44	63	54	35	29	32	19	6	12	2	2	2	86
September ...	36	66	51	42	29	36	20	4	12	2	1	1	87
October ...	50	68	59	32	26	29	15	6	11	3	0	1	88
November ...	37	62	50	38	32	35	21	5	13	4	1	2	85
December ...	43	67	55	38	26	32	16	5	11	3	2	2	87
The entire Year	47	63	55	35	30	33	16	6	11	2	1	2	88

(*b.*) *Results for the various Districts.*

Districts.	Percentages.												
	Complete Success.			Partial Success.			Partial Failure.			Complete Failure.			Sum of Successes, Complete and Partial.
	Wind.	Weather.	Average.	Wind.	Weather.	Average.	Wind.	Weather.	Average.	Wind.	Weather.	Average.	
Scotland, N. ...	47	69	58	36	25	31	15	5	10	2	1	1	89
,, E. ..	41	64	53	36	28	32	20	7	14	3	1	1	85
England, N.E.	52	65	59	36	29	33	11	5	8	1	1	0	92
,, E. ...	51	65	59	38	29	33	10	5	7	1	1	1	92
Midland Counties.	45	61	53	31	34	33	22	4	13	2	1	1	86
England, S. ...	63	58	61	27	35	31	9	5	7	1	2	1	92
Scotland, W. ...	50	67	59	33	28	30	13	4	9	4	1	2	89
England, N.W.	42	60	51	38	32	35	18	6	12	2	2	2	86
,, S.W.	45	57	51	37	35	36	16	6	11	2	2	2	87
Ireland, N. ...	43	68	56	34	25	29	18	6	12	5	1	3	85
,, S. ...	36	63	50	36	29	32	23	6	15	5	2	3	82
Summary ...	47	63	55	35	30	33	16	6	11	2	1	2	88

The following table shows the success of the Forecasts of the year in comparison with those of previous years. It gives for each

year of the decade 1896–1905 the percentages of complete and partial successes of the Forecasts issued at 8.30 p.m. In the reports for previous years the annual period included was that for the 12 months ending with March. The results for 1905, given below, are for the calendar year. The sum of successes (complete and partial) in 1905 was as high as in 1904–05, and was considerably above the average for the whole 10 years.

PERCENTAGES of SUCCESS in the FORECASTS for the whole of the BRITISH ISLES.

Year.	Complete Success.	Partial Success.	Sum of Successes, Complete and Partial.
1896–97	54	27	81
1897–98	55	26	81
1898–99	55	28	83
1899–1900	55	27	82
1900–01	57	27	84
1901–02	58	26	84
1902–03	53	35	88
1903–04	56	30	86
1904–05	57	31	88
1905	56	32	88
Average	55·6	28·9	84·5

STORM WARNINGS FOR THE COASTS OF THE UNITED KINGDOM.

Storm Warnings.

Warnings of coming storms have been dispatched by telegraph to stations on the coast supplied with signals to be hoisted as warnings to mariners. The signals are defined in Circular 717 of the Board of Trade, issued in February, 1874.

A list of the stations at which the signals are exhibited is given in Appendix II., pp. 59, 60. At the end of March, 1906, there were 240, of which 131 were in England and Wales, 70 in Scotland, 34 in Ireland, 3 in the Isle of Man, and 2 in the Channel Islands.

A comparison between the warnings issued during the year and the subsequent weather, in accordance with the method indicated in the Report for 1888–9, p. 64, is given in the following table.

Appended to the table are notes respecting the gales for which no warnings were issued, with brief statements as to the circumstances under which they occurred.

COMPARISON between the WARNINGS and the subsequent WEATHER in each half of the Year 1905.

Coasts.	Total No. of Warnings.	Warnings justified by subsequent Gales. Force 8 and upwards.	Warnings justified by subsequent strong Winds. Forces 6 & 7.	Warnings not justified by subsequent Weather.	Warnings late. Force 9 reached at two Stations before issue.	Warnings partially late. Force 9 reached at one Station before issue.	Warnings issued in consequence of telegraphic errors.	Storms for which no Warning was issued.
Scotland, N.E. ...	20	11	7	1	—	1	—	Feb. 10–11.
	25	12	12	—	1	—	—	Oct. 13; 30–31; Nov. 10–11.
,, E. ...	16	8	5	3	—	—	—	
	16	1	13	2	—	—	—	
,, N.W. ...	27	11	11	3	—	2	—	
	24	10	10	3	1	—	—	
,, W. ...	25	12	10	3	—	—	—	
	22	8	12	1	—	1	—	
Ireland, S. ...	25	17	7	1	—	—	—	
	28	20	6	2	—	—	—	
,, N. ...	28	16	10	2	—	—	—	
	29	17	9	2	—	1	—	Aug. 19–20.
Irish Sea ...	24	17	5	1	1	—	—	April 5.
	26	16	7	2	—	1	—	Aug. 19–20.
St. George's Channel	23	12	8	3	—	—	—	
	25	12	10	3	—	—	—	
Bristol Channel...	24	14	9	1	—	—	—	
	27	18	6	1	—	2	—	Oct. 30; Nov. 19.
England, S.W. ...	19	14	3	2	—	—	—	
	28	13	11	4	—	—	—	Oct. 30.
,, S. ...	18	12	2	4	—	—	—	
	25	14	8	3	—	—	—	
,, S.E. ...	18	8	7	3	—	—	—	
	22	9	10	3	—	—	—	Oct. 30–31.
,, E. ...	17	8	7	2	—	—	—	
	17	6	8	2	—	1	—	
,, N.E. ...	17	12	4	—	—	1	—	Jan. 30–31.
	17	4	10	3	—	—	—	Oct. 13.
Totals Jan.–June	301	172	95	29	1	4	—	
Totals July–Dec.	331	160	132	31	2	6	—	
Percentages	—	57·2	31·6	9·6	0·3	1·3	—	
Percentages	—	48·3	39·9	9·4	0·6	1·8	—	
For the whole year Totals...	632	332	227	60	3	10	—	
For the whole year Percentages	—	52·5	35·9	9·5	0·5	1·6	—	

NOTE.—In order to facilitate comparison with the statistical tables of the Board of Trade which are made up for the year ending June 30, the figures for the two halves of the year 1905—January 1 to June 30, and July 1 to December 31—are given separately for each district. The upper line of figures in each case gives the particulars for the first half of the year.

GALES EXPERIENCED in 1905 for which no WARNINGS were issued.

These were, as a rule, confined to limited portions of our coasts. They occurred on the following dates :—

(1.) *January 30th. A Westerly Gale in England, North-East.*—Warnings were on this occasion issued to all our western and northern coasts. The gale extended along our north-east coasts further south than was anticipated.

(2.) *February 10th–11th. A North-Westerly to Northerly Gale in Scotland, North-East.*—This gale was caused by a large depression which travelled south-eastwards across Scandinavia. The disturbance did not appear likely to affect any part of our own coasts.

(3.) *April 5th. A North-Westerly to Northerly Gale in the Irish Sea.*—In this case, as in the former, a deep depression moved south-eastwards across Scandinavia. The gale which occurred in the Irish Sea, and blew, very sporadically, in some other districts, was due apparently to the movement of small secondary disturbances, not clearly shown on the weather maps for the day.

(4.) *August 19th–20th. A Westerly Gale in Ireland, North and the Irish Sea.*—Caused by secondary disturbances which appeared in the rear of a depression moving north-eastwards along our extreme western and northern coasts. Strong breezes were forecasted, but it was not anticipated that the wind would blow with the force of a gale.

(5.) *October 13th. A Northerly Gale in Scotland, North-East and England, North-East.*—Due to the appearance of a large depression over Scandinavia, and to a simultaneous increase of pressure in these Islands. At 6 p.m. on the 12th the conditions did not appear sufficiently threatening to justify the issue of warnings; next morning the slight gale which had then set in on our northern coasts was not expected to continue or extend.

(6.) *October 30th–31st. An Easterly to South-Easterly Gale in Scotland, North-East, and a South-Westerly to Westerly Gale on several parts of our South and South-West Coasts.*—Caused by a depression which moved very slowly eastwards across the country. Warnings were issued on the morning or afternoon of the 28th, and were justified by a gale which commenced on the 28th or 29th, and which appeared to end on the morning of the 30th. The renewal of the gale on the night of the 30th was not anticipated.

(7.) *November 10th–11th. A South-Easterly Gale in Scotland, North-East,* felt, quite sporadically, on many other parts of our coasts. Caused by a depression which spread

in from the Atlantic. The fall of the barometer on the evening of the 10th was not regarded as sufficiently serious to justify the issue of warnings.

(8.) *November 19th. A Gale from East or North-East in the Bristol Channel.* — The English Channel was duly warned, but the gale extended slightly further north than was anticipated, and affected a portion of the Bristol Channel.

Comparison of results for 1905 with previous years.

The following table contains a statement of the amount of success of storm warnings in each year and the average for the decade 1896–1905 :—

Years.	Total No. of Warnings issued.	Warnings justified by subsequent Gales.	Warnings justified by subsequent strong Winds.	Total Warnings justified.	Warnings not justified by subsequent Weather.
		p.c.	p.c.	p.c.	p.c.
1896 ...	467	67·7	23·8	91·5	5·6
1897 ...	596	60·1	31·7	91·8	4·5
1898 ...	581	59·8	27·5	87·3	8·2
1899 ...	504	59·3	31·9	91·2	4·8
1900 ...	512	66·2	25·8	92·0	6·3
1901 ...	498	62·3	26·1	88·4	7·4
1902 ...	535	55·5	32·0	87·5	9·0
1903 ...	757	62·6	27·3	89·9	7·3
1904 ...	539	59·4	30·4	89·8	6·7
1905 ...	632	52·5	35·9	88·4	9·5
1896–1905	562	60·5	29·2	89·8	6·9

Averages

The corresponding figures for the average of three previous decades are as follows :—

Decade.	Total No. of Warnings issued.	Warnings justified by subsequent Gales.	Warnings justified by subsequent strong Winds.	Total Warnings justified.	Warnings not justified by subsequent Weather.
		p.c.	p.c.	p.c.	p.c.
1875–84...	440	56·9	23·0	79·9	16·9
1885–94...	503	58·3	27·0	85·3	12·0
1895–1904	551	61·5	28·4	89·9	6·8

III.—Statistics and Library Branch.

(*a*) Climatology of the British Isles.

A list of stations in connexion with the Office, in which particulars are given of the orders of the stations and of the official publications for which the returns have been prepared, will be found in Appendix II. on pp. 72–93.

some cases, duration of bright sunshine. Under the arrangement, the Royal Meteorological Society has supplied returns from three stations on the form A, from 12 stations on the form B, and from ten stations on the weekly form. The Scottish Meteorological Society has supplied returns from three stations on the form A, from 15 stations on the form B, and from seven stations on the weekly form.

The geographical distribution of the climatological and additional rainfall stations and of the sunshine stations enumerated in the list on p. 72, is as follows :—

District.	Normal Climatological.	Auxiliary Climatological.	Additional Rainfall.	Sunshine.
Scotland, N.	6	1	3	5
,, E.	9	0	0	5
England, N.E.	12	5	10	11
,, E.	10	10	6	12
,, Midlands	12	18	15	14
London County	2	1	1*	5
England, S.	5	21	15	21
Scotland, W.	7	1	1	3
England, N.W. and N. Wales ...	8	9	4	16
,, S.W. and S. Wales ...	4	10	15	15
Ireland, N.	4	2	4	2
,, S.	6	8	12	6
Channel Islands	1	1	0	3

Among the stations which have been discontinued in the course of, or at the end of the year, are Braemar, Wessington Court, and the London station at Brixton. In the Weekly Weather Report, Balmoral has been substituted for Braemar, and Dumfries has been included in district 6 in place of Aspatria, which is now included in district 7. At Fort William a climatological station has been started in connexion with the Scottish Meteorological Society since the discontinuance of the observatory there. Five other climatological stations have been added to the list in the course of the year.

The Committee note with regret the death of Mr. C. W. Curtis, J.P., who took observations of rainfall at Kearsney Abbey from 1892 to 1905.

The returns from the climatological stations are examined and filed in a convenient form for reference. When they are prepared for press they are carefully checked by comparison with the returns from neighbouring stations.

TELEGRAPHIC REPORTING STATIONS.—The returns from these stations are dealt with in the first instance in the forecast and storm warning branch. The comparison of the telegraphic

* In addition there are six autographic rain gauges in the London County area.

messages with the MS. sheets sent in each month by the observers, and the computation of monthly means and of average values for the months has, as before, devolved on the Statistical Branch. The results have been used in the preparation of climatological returns.

Sea Temperature Stations.

SEA TEMPERATURE STATIONS.—The list has been extended by the addition of three stations. The returns are dealt with by the Marine Branch.

Additional Rainfall Stations.

ADDITIONAL RAINFALL STATIONS.—The returns from these stations are for the most part not published, except in such occasional publications as the Rainfall Tables of the British Isles. Copies of some of the returns have been supplied to Dr. H. R. Mill for the use of the British Rainfall Organisation. They are used in answering inquiries and in special investigations.

Inspections.

INSPECTION OF STATIONS.—In order to secure uniformity of method and to guard against instrumental errors, the stations in connexion with the Office are inspected from time to time. The stations in connexion with the Royal Meteorological Society are visited by an Inspector appointed by the Society. In accordance with the recommendation of the Treasury Committee (1877), a contribution towards the cost of this inspection is made by the Office.

A list of the stations visited during the year 1905 is given in Appendix VI., p. 126.

PUBLICATIONS PREPARED.

Weekly Weather Report.

WEEKLY WEATHER REPORT.—The returns received have been used for the preparation of the statistical tables of the Weekly Weather Report. At the commencement of January 1906 the following changes were introduced into the report. (1) Statistical tables giving cumulative values for the season have been included on the front page. (2) The grouping of the stations in the districts has been revised, and in some cases a subdivision of the districts has been indicated in order to facilitate the computation of values for the divisions adopted by the Board of Agriculture. (3) Observations of the temperature, humidity, and direction and force of the wind in the upper atmosphere, taken by means of kites, have been added.

The monthly and annual summaries and appendices of the report have been prepared as heretofore. The quinquennial appendix, giving for each district, average cumulative values of rainfall, accumulated temperature, and bright sunshine, to the end of each week in the year for the lustrum 1901–1905, and for the period 1881–1905 has been prepared.

At the close of the year the monthly summary contained full summaries in a form similar to the form B referred to above, for 55 stations, and abridged summaries for 102 stations.

Second Order Stations.

METEOROLOGICAL OBSERVATIONS AT STATIONS OF THE SECOND ORDER.—The twenty-sixth volume of this publication

containing the observations for the year 1901, was prepared and carried through the press. It gives detailed daily observations in the international form A referred to above, for 21 stations, and monthly summaries in the form B for these stations and for 54 additional ones.

QUARTERLY RETURNS FOR THE REGISTRARS GENERAL.—Weekly summaries for 17 stations, and monthly and quarterly summaries for 58 stations have been prepared for the reports of the Registrar General of Births, Deaths, and Marriages for England and Wales and for Ireland.

(*b.*) CLIMATOLOGY. FOREIGN AND COLONIAL STATIONS.

Foreign and Colonial Stations.

A list of Foreign and Colonial Stations from which documents have been received in the course of the year is given in Appendix II., p. 94.

Of these stations, one, St. Helena, has an anemograph in addition to the usual climatological instruments. Six are in Cyprus and have been in operation since 1881. Eight are in the West Indies, of which 6 are in the Bahamas. Five of the Bahamas returns are lighthouse registers. Nine stations are in West Africa, 12 in Central Africa, and one in British East Africa. Six are on the Mediterranean Coast. Two are in Central or South America, two in the Falkland Islands, one (Mauritius) in the Indian Ocean, and one in the Pacific. The observations from the six stations in Cyprus are prepared in the Office for publication in the Cyprus Blue Book.

(*c.*) ISSUE OF PUBLICATIONS.

Issue of Publications.

Applications from the Hydrographical Bureau, Darmstadt; Transvaal Meteorological Department, Johannesburg; Aerodynamical Institute, Koutchino; Royal Prussian Aeronautical Observatory, Lindenberg; Messina Observatory; Wetterbureau, Berlin; Observatoire de l'Ebre, Tortosa; and Public Free Libraries at Fulham and Stamford, for free copies of one or more of the current publications of the Office, have been granted.

The following publications have been issued :—i. The Daily Weather Report (*see* p. 56); ii. The Weekly Weather Report (*see* pp. 39, 61), with monthly, quarterly, and annual supplements; iii. Monthly Pilot Chart of the Atlantic and Mediterranean; iv. Hourly Readings at four observatories, 1902, 1903; v. "Charts showing the Surface Temperature over the Atlantic, Indian and Pacific Oceans" (2nd edition); vi. "Barometer Manual for the use of Seamen" (5th edition); vii. The relation between Pressure, Temperature and Air circulation over the South Atlantic Ocean.

A complete list of the publications which have been issued by the Office is given in Appendix II., p. 97, and in Appendix XI., p. 184, of the Report of 1903–04, is given a list of important contributions to meteorology, which have not been issued as separate publications, but have been included in various Reports issued by the Office since 1866.

(*d.*) INQUIRIES.

The inquiries dealt with in the Statistics and Library Branch during the year were 759 in number, of which 160 were by letter and the rest personal inquiries. The whole number may be classified as follows :—Inquiries for scientific and industrial purposes, 293 ; for evidence in legal proceedings, 99 ; for forecasts of weather, 77 ; from newspaper correspondents for special weather information, 206 ; miscellaneous, 84. Inquiries.

Among the special inquiries dealt with during the year the following may be mentioned :—

(1.) From Dr. von Rijckevorsel, for daily barometer readings at stations south of latitude 20° S.

(*e.*) LIBRARY.

The main part of the Library consists of weather maps and other publications of the Weather Offices of different countries, and meteorological reports and publications received from all quarters of the globe. Most of these are presented or obtained by way of exchange, but a few standard works and serial publications are purchased. The Library consists at present of about 19,000 volumes and pamphlets ; of which about 600 were received during the past year. Library.

In Appendix VII., p. 129, will be found (1) a list of persons and institutions from whom publications containing meteorological data have been received during the last three years, with a brief indication of the nature of the information given ; (2) a list of periodicals containing memoirs on meteorological subjects which are received by the Office.

Among the most important additions to the Library during the past year may be mentioned M. G. Eiffel's Discussion of Observations at Beaulieu, Sèvres and Vacquey ; the Results of the Voyage of the S.S. "Belgica," in connexion with the Belgian Antarctic Expedition ; Meteorological Observations during the Norwegian North Polar Expedition in 1893–96, by H. Mohn ; Part 3 of the Meteorology of the Ben Nevis Observatories, by A. Buchan and R. T. Omond ; and a new edition of Börnstein's "Leitfaden der Wetterkunde." Among those acquired by purchase have been "Two years in the Antarctic," by A. B. Armitage ; "The Siege of the South Pole," by H. R. Mill ; "Cloud Studies," by A. W. Clayden ; "Lehrbuch der Meteorologie" (2nd edition), by J. Hann ; "Modern Lightning Conductors," by Killingworth Hedges ; "Meteorologie und Klimatologie," by W. Trabert ; and a selection of the volumes of the International Catalogue of Scientific Literature.

The Library is available for the use of students and others between the hours of 10 a.m. and 4 p.m. A number of persons have availed themselves of this accommodation.

IV.—Observatory Branch.

ervatories. STATIONS OF THE FIRST ORDER: OBSERVATORIES.—The Committee have continued to maintain the Observatory at Valencia (Cahirciveen), and have also continued their contributions to the maintenance of the meteorological observatories at Kew, Falmouth and Aberdeen, at which the self-recording instruments belonging to the Committee are under the management of the National Physical Laboratory, the Royal Cornwall Polytechnic Society and the University of Aberdeen, respectively. The arrangement with the observatories at Glasgow and Stonyhurst, under which copies of the records of the self-recording instruments are supplied to the Office, have been likewise continued.

The curves received from the observatories and the tabulations of readings at each hour made by the observers up to the close of the year, have been carefully examined.

The form now adopted for the publication of these observations was first used for the data for the year 1900.

Three volumes of the new series giving hourly readings have been published, and the volume for 1903 was almost ready for issue at the close of the year. They contain readings for each hour of barometric pressure, temperature of the dry and wet bulbs, wind direction and velocity, rainfall and sunshine, with the hourly means for the month and for a long series of years.

mograph ions. ANEMOGRAPH STATIONS.—By the courtesy of the Cork Harbour Commissioners, Roche's Point has been added to the list of anemograph stations in connexion with the Office.

The records from the auxiliary anemographic stations have been tabulated up to date for the purpose of checking the storm warnings.

shine ions. SUNSHINE STATIONS.—These are now all provided with instruments of the Campbell-Stokes design. At the close of the year original cards were being received from 100 stations, 98 of which are in the British Isles, one at the Falkland Isles, and one in China. The cards, after examination, are stored in the Office for reference.

In addition to the cards, tabulations of the daily amount of sunshine have been received from 16 other stations for insertion in the Weekly Weather Report, &c. The geographical distribution of all the British stations sending in sunshine returns is shown in the small table in Section III., p. 38.

litional ions red. The Committee would welcome additional observations, especially from Scotland and Ireland and the inland parts of Wales and from the south-west of England.

The sunshine cards for the year from all stations have been examined, and any questions arising from the examination have been dealt with.

The supervision of the anemometric experiments at Holyhead and the discussion of the records of the St. Helena anemometer, also devolve upon the Observatory Branch.

The reduction and tabulation of the land observations of the National Antarctic expedition is being carried out by this Branch. At the close of the year the preparation for the press of the Journal of Observations at the winter quarters and on the sledge journeys was completed.

V.—Instruments Branch.

During the year 1,018 instruments of various kinds have been supplied for the use of H.M. ships as compared with 1,733 in the previous year.

Mercantile Marine.

The total number of instruments issued to the mercantile marine in the past year was 747, as compared with 1,058 in the previous year. Details are given in Appendix V. The approximate number of ships employing instruments belonging to the Office for observations during the year was 210, as compared with 193.

Stations.

The instruments at the telegraphic reporting stations have been maintained in proper order and replaced when necessary.

Fishery Barometers, Inspections.

During the year arrangements have been made with the Fisheries Board for Scotland, the Department of Agriculture in Ireland, and the Board of Agriculture and Fisheries in England and Wales, whereby the Inspectors of these departments examine and report upon the Fishery Barometers belonging to this Office, situated in their respective districts.

During the year a mercurial barometer has been supplied to Pwllheli, N. Wales, and a barograph to Rosbeg, Co. Donegal; the instruments at West Mersea and Exmouth have been renewed; whilst those at Felixstowe, Boscastle, and Nevin, have been returned and the stations discontinued.

There are now 232 stations on the coast of the British Isles supplied by the Committee with barometers for the benefit of sailors and fishermen. Of these, 65 stations are in England, 7 in Wales, 66 in Ireland, 89 in Scotland, 4 in the Isle of Man, and 1 in Jersey. A list of the stations is given in Appendix II.

With the assistance of the above-mentioned departments the list of fishery barometer stations is in course of revision.

Instruments have again been lent for a winter station at Southampton Island (Hudson's Bay).

Observers.

A considerable number of instruments have been supplied upon repayment to Colonial Governments and local authorities or to observers, including the following:—

Agent-General, New South Wales.
Leeds University.

Borough of Folkestone.
House of Commons Ventilation Committee.
Captain Tamplin, Chin-Kiang.
Borough of East Ham.
Batavia Observatory.
C. F. Mott, Esq., Giggleswick.
J. Smith, Esq., Crathes.
Whitworth Park Observatory, Manchester.
Towyn Urban District Council.
Meteor. Centralstadt, Helsingfors.
R. A. Easton, Esq., Winslow.
A. Henderson Bishop, Esq., Lanarkshire.
J. Firth, Esq., Huddersfield.
T. L. Hutchins, Esq., M.A., Kirton, Boston.
Hon. C. Brand, J.P., Little Dene, Lewes.

New sunshine recorders have been supplied to Folkestone, Llangammarch Wells, Haverfordwest, Margate, Carnforth and Huddersfield.

The following have been supplied for the Crown Agents for the Colonies :—

23 Mercury Barometers.
1 Barograph.
107 Ordinary Thermometers.
77 Max. do.
51 Min. do.
36 Solar do.
47 Grass Min. do.
5 Screens and Cages.
53 Raingauges and glasses.
174 Additional Glasses.
3 Sunshine Recorders.
8 Earth Thermometers.
11 Hygrometers.
1 Anemometer.
1 Wind Vane.
3 Boxes Ozone papers.
5 Aneroids.
1 Evaporation Gauge.
1 Cloud Camera.
3 Cameras and supply of photographic materials.
1 Halliwell's Recording Raingauge.
2 Hypsometers.
2 Prismatic Compasses.
2 Standard Thermometers.
1 Wolkenspiegel.
Repairs to 3 Barometers.
„ 1 Barograph.
„ 4 Aneroids.
7,000 Charts for Recording Instruments.

Various other instruments have been supplied for use at stations, including a set of marine instruments lent to the Royal Naval Hospital School, Greenwich.

VI.—Correspondence and Accounts Branch.

Appendix IX., p. 149, shows the receipts and payments during the year ending 31st March, 1906. The amount voted by Parliament was £15,300, as in the previous year, and the miscellaneous receipts amounted to £3,412 11*s.* 7*d.*

The following abstract shows approximately the net payments of this and the preceding year, together with the increase or decrease in 1905–6, as compared with the previous year :—

NET EXPENDITURE.	1904–5.	1905–6.	Increase.	Decrease.
GENERAL ADMINISTRATION :	£	£	£	£
Council and Secretary ...	1,464	—	—	423
Director and Committee ...	—	1,041		
Office:				
Correspondence and Accounts Branch ...	1,087	1,109	22	—
Rent, Fuel, and Lighting	721	719	—	5
Alterations to premises and contingencies ...	573	384	—	189
Expenses incidental to International Meteorological Congress ...	29	21	—	8
SPECIAL RESEARCHES ...	858	380	—	478
LAND METEOROLOGY ...	4,078	4,006	—	72
WEATHER INFORMATION ...	2,785	2,777	—	8
INSPECTIONS	432	403	—	29
OCEAN METEOROLOGY ...	1,502	1,820	318	—
INSTRUMENTS	952	608	—	344
SUPERANNUATION ACCOUNT	1,247	483	—	764
Total ... ... £	15,731	13,751	340	2,320

The following notes explain the chief causes of variation in the year 1905–6 :—

The only payment on behalf of the Committee was for travelling expenses.

Under alterations to premises and contingencies some special items of expense were brought to account in 1904–5.

The decrease under Special Researches is due partly to the transfer of the salaries of a portion of the staff to Ocean Meteorology, or to Instruments.

The increase under Ocean Meteorology is chiefly due to the transfer of salaries previously charged under Special Researches.

The decrease under Instruments is due to repayment for instruments supplied to the Royal Navy ; there was an increase in the net cost of instruments.

Under Superannuation no addition to the Investment was made in the year 1905–6.

£1,535 was paid to the Post Office during the year 1905–6 on account of inland and foreign telegrams, allowances to telegraph clerks, rental of private wires, &c.

W N. SHAW,
Chairman.

July 26th, 1906.

APPENDIX.

APPENDIX I.

CORRESPONDENCE WITH H.M. TREASURY.

I.—CONSTITUTION OF THE METEOROLOGICAL COMMITTEE.

Letter from the Secretary of the Treasury.

M.O. 1264.

Treasury Chambers,
23rd May, 1905.

SIR,

I AM directed by the Lords Commissioners of His Majesty's Treasury to transmit, for your information and guidance, a copy of a Minute by this Board dealing with the future constitution of the Meteorological Office.

It is Their Lordships' desire that, subject to the changes indicated in the Minute and to any others which the Committee may see fit to adopt hereafter, the work of the Office should proceed generally on the lines hitherto followed; and in nominating you to be Chairman of the new Committee, My Lords feel that They have taken the best security for the promotion of the interests of Meteorological Science and the successful working of the institution.

I am to suggest that a meeting of the Committee should be summoned for an early date, and that they should be requested to consider the following points:—

(1.) Whether the Committee should continue to be registered under the Companies Acts, or whether some other constitution would be preferable.

(2.) The powers to be delegated to the Director; and

(3.) The arrangements to be made for the administration and audit of the Parliamentary Grant.

My Lords would be glad to learn the conclusions at which the Committee arrive on these points.

I am, &c.,
G. H. MURRAY.

Dr. Shaw, F.R.S.,
Meteorological Office.

Treasury Minute, dated 20th May, 1905.

My Lords resume consideration of the Report of the Committee presided over by Sir Herbert Maxwell on the administration of the Meteorological Office.

Since the issue of the Report My Lords have been in communication with the Royal Society, the Board of Admiralty, the Board of Trade, and the Board of Agriculture and Fisheries, and They are now in a position to place on record the conclusions at which they have arrived.

1. The Meteorological Office will, as from the 1st April, 1905, be placed under the management of a Committee constituted as follows :—

The Director of the Meteorological Office.

Two members nominated by the Royal Society.

The Hydrographer of the Navy.

One member nominated by the Board of Trade.

One member nominated by the Board of Agriculture and Fisheries.

One member nominated by the Treasury.

The members of the Committee will be appointed by the Treasury, and, subject to the discretion of the authorities by which they are respectively nominated, will hold office for a period not exceeding five years; but will be eligible for re-appointment.

2. The Director will be appointed by the Treasury, and will receive out of the grant in aid a salary of £800, rising after five years to £1,000 per annum, without a title to pension. He will hold office for a period of five years, but, like the other members of the Committee, will be eligible for reappointment until he attains the age of 65. The present Director will receive the maximum of the scale, namely, £1,000 per annum, from the 1st April, 1905.

3. Subject to the general control of the Committee and to such regulations as may be laid down by the Treasury, the Director will be responsible for the administration of the Office.

4. The Director will act as Chairman of the Committee, and will summon it at such times as he considers desirable ; but four meetings at least shall be held during the year.

5. The members of the Committee will not receive remuneration for their services, but travelling and subsistence expenses will be allowed in the case of members not residing in the Metropolis.

6. My Lords will ask Parliament annually to vote a grant in aid of the expenses of the Office. For the present this grant is fixed at £15,300.

7. The grant will be administered by the Committee, who may with the consent of the Treasury, delegate to the Director such powers of expenditure as they consider proper. All cheques will be signed by the Director and countersigned by a member of the Committee.

8. The Committee will make an annual report for presentation to Parliament, and will at the same time transmit to the Treasury a statement of their accounts in such form as may be prescribed.

In December of each year the Committee will submit a statement showing the manner in which it is proposed to apply the grant for the ensuing financial year

9. The staff will be appointed, and their salaries fixed, by the Committee on the recommendation of the Director.

10. In the absence of the Director, the Committee may appoint one of its members to act as interim Director.

11. My Lords are pleased to appoint the following gentlemen to be members of the Committee :—

Mr. W. N. Shaw, Sc.D., F.R.S., Director.

Captain Arthur M. Field, R.N., Hydrographer to the Navy.

Captain A. J. G. Chalmers, Professional Officer of the Marine Department, Board of Trade.

Mr. W. Somerville, Sc.D., Assistant Secretary of the Board of Agriculture and Fisheries.

Professor G. H. Darwin, F.R.S., University of Cambridge.

Professor Arthur Schuster, F.R.S., University of Manchester.

Mr. G. L. Barstow, nominated by the Treasury.

II.—Observations in the Colonies.

Letter from the Secretary of the Treasury, with enclosure.

M.O. 2030.

Treasury Chambers,
26th August, 1905.

SIR,

I AM directed by the Lords Commissioners of His Majesty's Treasury to transmit to you herewith (in original and to be returned) the accompanying letter from the Colonial Office (with enclosures), dated the 5th instant, relative to the collection of Meteorological Returns from the Colonies, and to say that My Lords would be glad to be favoured with the observations of the Meteorological Committee upon the questions raised therein.

I am, &c.,
G. H. MURRAY.

The Director,
Meteorological Office.

Downing Street,
5th August, 1905.

SIR,

I AM directed by Mr. Secretary Lyttelton to request you to inform the Lords Commissioners of the Treasury that as the result of an enquiry from the United States Weather Bureau for meteorological information with regard to Weihaiwei, he has had his attention drawn to the absence of any organisation for the collection and publication of Meteorological Returns from the

Colonies generally, and for affording information to persons making enquiries as to climatic conditions in various parts of the British Empire.

It would appear that to a great extent in response to a circular of the 27th of July, 1895, the Meteorological Office receive a considerable amount of information, as shown in the enclosed print, which could with a little trouble be largely increased. Owing, however, to the want of the necessary clerical assistance most of these valuable returns serve no useful purpose, although occasionally tables have been prepared by voluntary assistants, as in the case of the observations for Tropical Africa recently classified by Mr. E. G. Ravenstein and officially published for the Meteorological Council.

I am to enclose for their Lordships' information a copy of the correspondence which has taken place on this subject, from which it would appear that the necessary collection and collation of returns, &c., could be done by a clerk at from £150 to £200 per annum under the supervision of the Meteorological Council. Mr. Lyttelton understands that the cost of printing and publication would amount to about the same sum, so that the total cost should not be more than from £300 to £400 per annum. This does not seem to be an excessive amount for the performance of work of such importance, both from an economic and from a purely scientific point of view. Mr. Lyttelton would therefore be glad if their Lordships could see their way to sanction the provision on the Estimates for 1906–7 of a sum of money for this purpose.

I am to add that Mr. Lyttelton has been approached by the British Association with a proposal for a large scheme involving the creation of a separate Office, but after due consideration he has decided that the proposal is not one that he can recommend to their Lordships.

I am, &c.,

The Secretary to the Treasury. C. P. LUCAS.

From the Committee to the Treasury, in reply.

Meteorological Office,
63, Victoria St., London, S.W.,
7th December, 1905.

SIR,

WITH reference to Sir G. H. Murray's letter of the 26th August last (No. 1479/05), enclosing correspondence between the Colonial Office and the Meteorological Council, I am authorised by the Meteorological Committee to say that they concur in the opinion expressed by the Council and supported by the Secretary of State, that it is desirable to place upon an organised footing the collection and publication of Meteorological statistics of those Colonies and Dependencies which have no separate meteorological organisations.

They further agree that the simplest method of dealing with the question would be for the Meteorological Office to be definitely charged with the duty of preparing for official publication an annual volume of Meteorological Statistics for the Crown Colonies and Dependencies, with such information about the publications of the Meteorological Organisations of India, Canada, Australia and South Africa as would enable a reader to find his way to any information that is available about climatic conditions in various parts of the Empire.

The cost to the Office involved in carrying out this suggestion would be represented by an appropriation of about £200 for clerical work, on the understanding that the general direction and supervision could be accepted without special provision. The cost of the printing, which does not fall upon the Office Grant, would be in addition to that sum. The cost of the recently published volume of Observations in Tropical Africa referred to in the letter from the Secretary of State for the Colonies is reported by the Stationery Office to have been nearly £46.

The Committee have carefully considered the allocation of the Meteorological Grant in order to see whether, under the new conditions, they could find the means for this work, but they find that the maintenance of the work which the Office has in hand already will absorb the funds at the disposal of the Committee, so that the additional work could only be undertaken if some of the existing work were abandoned. Having regard to the various public interests involved, the Committee do not see their way to any immediate modification of the general scheme of operations of the Office, and they desire me to express their regret that they have been unable to set aside the necessary sum for the clerical work required for dealing with Colonial Meteorology in the Estimates for the ensuing year.

The enclosures in your letter under reference are herewith returned.

I have, &c.,
W. N. SHAW.

The Secretary to the Treasury.

Letter from the Secretary of the Treasury, with enclosure.

M.O. 3069.

Treasury Chambers,
22nd December, 1905.

SIR,

WITH reference to your letter of the 7th instant, I am directed by the Lords Commissioners of His Majesty's Treasury to transmit herewith, for your information, a copy of a letter of even date which They have addressed to the Colonial Office on the subject of the collection and publication of meteorological returns relating to the Colonies.

I am, &c.,
G. H. MURRAY.

The Director
of the Meteorological Office.

From the Treasury to the Colonial Office.

Treasury Chambers,
SIR, 22nd December, 1905.

I HAVE laid before the Lords Commissioners of His Majesty's Treasury, Mr. Lucas' letter (19,653/1905) of the 5th August last, in which attention is called to the desirability of improving the collection, &c., of meteorological returns from the Colonies generally, and it is suggested that arrangements should be made for the preparation and publication of a comprehensive volume of such statistics by the Meteorological Office from information supplied by the Colonies.

In reply I am directed to request you to inform the Secretary of State that the Meteorological Committee, on being consulted, have expressed their inability to undertake the additional work entailed by the proposed arrangement within the limits of their present resources; and that my Lords, on giving the matter their most careful consideration, do not feel able, in present circumstances, to authorise an addition for the purpose in question to the Grant-in-Aid now payable to the Committee. On the other hand, their Lordships believe that the requirements of the case could be substantially met by the improvement of the meteorological information contained in the various Colonial Reports. They would, therefore, suggest that the several Colonies and Dependencies should be requested to supply such information on a common (and extended) form in their periodical reports; and they have reason to believe that the Director of the Meteorological Office would be willing to co-operate to this end by suggesting improvements in the form in which these statistics are at present supplied.

I am, &c.,
(Sd.) G. H. MURRAY.

The Under Secretary of State,
Colonial Office.

From the Colonial Office.

M.O. 55.

Downing Street,
SIR, 4th January, 1906.

WITH reference to your letter (M.O. 910) of the 6th of June last respecting the desirability of affording better facilities for the collection and collation of meteorological records from the Colonies, I am directed by the Earl of Elgin to transmit for your information a copy of correspondence with the Treasury from which you will learn that the Lords Commissioners of the Treasury do not feel able to authorize an addition for this purpose to the grant-in-aid payable to the Meteorological Committee.

I am to state that Lord Elgin would be glad to receive your observations on the suggestion made by the Treasury at the end of their letter.

I am, &c.,
C. P. LUCAS.

The Secretary,
Meteorological Office.

III.—OFFICE PREMISES.

From the Committee to the Treasury.

Meteorological Office,
SIR, 9th February, 1906.

I AM desired by the Meteorological Committee to ask you to bring to the notice of the Lords Commissioners of H.M. Treasury the question of new premises for the Meteorological Office.

2. The question was originally raised by Sir Herbert Maxwell's Committee and has already been referred to by their Lordships in the correspondence with the Royal Society which followed the report of the Committee.

3. In considering the question the Meteorological Committee have taken into account the various requirements of the current work of the Office and the modifications which these requirements have undergone since the occupation of the present premises commenced in 1868. They desire me to note three points.

4. The necessity of being in close connexion with the Telegraph Service has become more urgent, and if the Office could be accommodated in the same building as a Post Office the Committee see their way to some economy in the expense of working, as well as increased efficiency.

5. The Office has now been in existence for upwards of 50 years, and its work has represented the expenditure of a large sum of money. Through its operations in conjunction with those of other countries, many important meteorological results have been obtained, and the position of the science of meteorology is in consequence different from that of 50 years ago. The Committee are of opinion that account ought to be taken of these facts in considering the question of new premises, and that provision should be made for the presentation of the more important meteorological results in a form which will interest and inform the general public, and be accessible in the same way as the scientific museums, and available like them for educational purposes.

6. The further progress of the science of meteorology would be greatly helped by the development of interest in the subject among students, as in the case of other sciences. Such development requires facilities for study which do not at present exist in

this country. The Meteorological Office has an abundance of material which is essential for the prosecution of meteorological researches, but it is not readily accessible for students. To develop in an effective manner the facilities which it can offer, the Office should be in juxta-position with a university so that the subject may have an opportunity of claiming the attention of students.

7. The Committee have considered whether any available site in London would satisfy these conditions without interfering with the ordinary work of the Office. I was requested to make inquiry with regard to the land under the control of the Commissioners for the Exhibition of 1851, which is appropriated in a special manner to the encouragement of science and art, and I have learned from the Secretary of the Office of Works that the erection of a Post Office on a site at South Kensington is under consideration.

8. Such an occasion seems to the Committee to offer an almost unique opportunity for satisfying the three requirements which have been mentioned, without sacrificing the facilities for the current work of the Office. Accommodation for the Office might be provided on the upper floors of a Post Office building; it would be in the immediate neighbourhood of the Science and Art Museums and accessible as they are for individual students, school classes and the general public; and being close to the headquarters of the University of London, it would open up the possibility of developing meteorology as a subject of academic study under most favourable conditions.

9. I am, therefore, to ask that their Lordships will take steps to ascertain whether accommodation for the Office could be provided on the Kensington Gore site in the manner indicated herein.

10. The accommodation in the present Office extends to 8,500 square feet. The area of floor space estimated to be necessary to give the accommodation required for the Meteorological Office is 10,000 square feet.

11. In respect of funds, the rental of the present premises (including rates and taxes) is £635 per annum. The Committee could not spend more in rent without trenching upon funds which are already employed in other directions, but they desire me to say that they regard the provision of suitable premises as a question of fundamental importance.

12. If the suggestion of the Committee meets with Their Lordships' approval, the Committee would desire to consult the Commissioners of the 1851 Exhibition and the authorities of the University before arranging details. The Committee have not felt themselves at liberty to approach either of these bodies formally before bringing the matter to their Lordships' notice, but they have reason to think from informal inquiries that the proposal would not be unacceptable.

I am, &c.,

W. N. SHAW.

The Secretary of the Treasury,
Whitehall.

From the Secretary of the Treasury.

M.O. 965.

Treasury Chambers,
SIR, 9th April, 1906.

THE Lords Commissioners of His Majesty's Treasury have had before them your letter of the 9th February last respecting the provision of accommodation for the Meteorological Office.

In reply, I am to state that My Lords are favourably disposed to the proposal that premises shall be constructed for the Meteorological Office in a block of buildings to be erected at South Kensington to contain a post office; and My Lords, on present information, believe that the rent payable by the Committee for such a building would not exceed by any considerable sum the amount expended by the Committee on the rent of their present premises.

Until it is known, however, what has to be provided for on the remainder of the site it is hardly possible to design a building of which the Meteorological Office would form a part, as such a design should be prepared as a whole, and so as to accord with the other buildings to be erected on the site.

My Lords must therefore request that they should not be regarded as definitely committed to the scheme for the erection of an office for the Meteorological Office in Exhibition Road; but the proposal will be borne in mind, and My Lords hope that it may prove feasible to carry it into effect.

I am, &c.,
G. H. MURRAY.

The Director,
Meteorological Office,
63, Victoria Street, S.W.

APPENDIX II.

STATEMENT OF PROVISIONS FOR THE SUPPLY OF INFORMATION TO THE PUBLIC, 1906–7.

THE METEOROLOGICAL OFFICE.

Established in 1854 as a department of the Board of Trade. From 1866 to 1877, with a Parliamentary Grant in aid, under the management of a Committee, and from 1877 to 1905 under a Council appointed by the Royal Society, and now under the control of a Director and Committee appointed by H.M. Treasury.

Director:

WILLIAM NAPIER SHAW, Sc.D., F.R.S.

Marine Superintendent:

Commander M. W. CAMPBELL HEPWORTH, C.B., R.N.R.

Superintendent of Statistics:

R. G. K. LEMPFERT, M.A.

Superintendent of Instruments:

ERNEST GOLD, B.A.

Chief Clerk and Cashier:

JOHN A. CURTIS.

OFFICE PREMISES.

63, Victoria Street, S.W.

Telegraphic address—"Weather, London."

The Office receives a large number of daily reports, and has gradually accumulated a valuable store of information about the weather in all parts of the world. The arrangements specified below have been made to enable the public to take advantage of this information.

The Office is open for general inquiries between the hours of 10 a.m. and 4 p.m. on week days (Saturdays, 1 p.m.), and for telegraphic inquiries from 8.30 a.m. to 8 p.m. on week days, and from 6 to 8 p.m. on Sundays. Office hours

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A.—Telegraphic Information.

Daily Weather Reports. Forecasts and Storm Warnings.

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Between 8 a.m. and 10 a.m. telegraphic messages are received daily, reporting meteorological observations at 27 stations (marked T in list of stations, pp. 72–91) in the British Isles, chiefly on the coast, and at 29 stations (p. 92) on the Continent of Europe. The observations in the British Isles are made at 8 a.m., and on the Continent partly at 7 a.m. and partly at 8 a.m. A certain number of stations report evening observations (6 p.m.), also by telegram, and those that do not report in the evening include the evening observations with the following morning reports, so that a complete schedule of morning and evening observations is drawn up daily. The information refers to the readings of the barometer, dry and wet bulb thermometers, maximum and minimum thermometers, rainfall, and in some cases, sunshine, with estimates of the direction and force of the wind, and reports of the weather and state of the sea.

These reports are supplemented by telegraphic reports from the Azores, through the courtesy of the Portuguese Government and the Eastern Telegraph Company and the Commercial Cable Company, and by a number of additional observations made at various stations in the United Kingdom, and sent either by telegram or by post through the courtesy of private persons or local officials. Moreover, the "Bulletin International" published in Paris, reproducing meteorological telegrams from the whole of Europe, is received by post on the morning of the day after publication, and supplements the information previously received in the Office by telegram.

The telegraphic information is tabulated and charted by about 10 a.m. for the morning observations, and 7 p.m. for the evening ones. A general report is then drawn up, and forecasts of the weather **for the twenty-four hours following the next noon, or midnight, as the case may be,** are formulated.

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A Daily Weather Report, which includes a transcript of the observations for the day, with some of those for the previous day, illustrative charts, descriptive remarks on the state of the weather, and forecasts for the several districts of the British Isles, is prepared for press and sent to the lithographers at 12 noon daily, except Sundays and Bank Holidays. It is ready for issue by 2 p.m., and is then delivered by hand or posted by book post at 2.30 p.m. to those addresses which can be reached in the regular course of post on the same day. Copies for those who are outside this limit are posted by the evening mails.

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The Daily Weather Report may be obtained on payment at the Meteorological Office of a subscription in advance (for not less than a quarter of a year ending at the official quarter days, *e.g.*, March 31, June 30, &c.) at the rate of £1 per annum for delivery by book post, £2 for delivery, where feasible, by hand. Single copies, price 1*d.* each, can be obtained after 3 p.m. on the day of issue at the

Office, and at the railway bookstalls at the following terminus stations :—Victoria (L. B. S. C., and S. E. and C. Railways), Charing Cross, King's Cross, St. Pancras, Euston.

Special Reports for the Press.

Special advance copies of the descriptive remarks on the state of the weather and forecasts, based upon the morning or evening observations, are prepared at 11 a.m. and 8 p.m. respectively, and supplied gratis to the representative of any newspaper or press agency calling for them at the Office, at the hours named.

As far as practicable the Director will make arrangements for daily or weekly reports of the state of the weather, in special form, upon terms which may be had upon application at the Office personally or by letter.

Printed forecasts.

Typewritten copies of the morning forecasts for all districts are ready at 11 a.m., and are distributed by hand to clubs and societies situated in or near Pall Mall at a charge of 10*s.* per annum. They are sent by post at a charge of 2*s.* 6*d.* per official quarter or any part thereof, in addition to the cost of transmission. Copies of the evening forecasts are sent by post for a similar charge.

Written forecasts for separate districts, and other extracts from the daily Reports

For the purposes of the forecasts of weather the British Isles are divided into eleven districts, as indicated in the accompanying maps. A written copy of the latest forecast for a single district can be obtained at the Office between 9.30 a.m. and 8 p.m. upon payment of 6*d.* A written copy of the latest information in possession of the Office as to the state of the weather in any district of the British Isles, and for the neighbouring parts of the continent of Europe, can be obtained in like manner. The latest reports, with a map, are exhibited as early as possible for the information of the public at the entrance to the Office, and, by the courtesy of H.M. Office of Works, in Saint James's Park, opposite the Horse Guards, and abbreviated reports for a few coast stations are displayed in the street, on the balcony of the Office.

FORECAST DISTRICTS.*

0. SCOTLAND, NORTH.
1. SCOTLAND, EAST.
2. ENGLAND, N.E.
3. ENGLAND, EAST.
4. MIDLAND COUNTIES.
5. ENGLAND, SOUTH, and English Channel.
6. SCOTLAND, WEST, and Isle of Man.
7. ENGLAND, N.W., and North Wales.
8. ENGLAND, S.W., and South Wales.
9. IRELAND, NORTH.
10. IRELAND, SOUTH.

* For the grouping of the counties to represent approximately the forecast districts, *see* Lists of Stations, pp. 72 to 91.

Inquiries by telegraph.

By arrangement with H.M. Postmaster-General the latest information as to the state of the weather in various parts of the United Kingdom, or the Continent, and forecasts for one day in advance, can be obtained from the Meteorological Office, upon payment at any Postal Telegraph Office of a fee of 6*d.* in addition to the cost of a telegram of inquiry addressed "Weather, London," and of the reply. Ten words, in addition to the address, must be allowed for the reply.

Telegrams of inquiry should state the nature of the information required, and the name and address to which the information is to be sent, as in the following examples :—

To "Weather, London."

Latest Information from [*Straits of Dover*].

or,

Latest Forecast for [*Forfarshire*].

or,

Next Forecast for [*Dublin*].

From (Name), (Address)

Inquiries by post.

The latest information for any district, or the latest forecast, will be sent by telegraph to any address if a request be received by post stating when the information or forecast is to be sent, and enclosing 6*d. in addition to the cost of a telegram*, allowing ten words in addition to the address. It should be noted that forecasts are prepared for issue at 11 a.m. and 7.30 p.m. To avoid delay, letters of request for information or forecasts should be marked on the outside "Forecast Branch."

Forecasts for a single district will be sent regularly to public bodies for exhibition without any charge beyond the cost of the telegrams, and to private persons at an additional charge of 3*d.* per telegram for a forecast for a single district, and 6*d.* for two or more districts.

Harvest forecasts.

Arrangements have been made for a special service of afternoon reports during the season of the Hay and Corn Harvests (June 1st to September 30th), with a view to a special series of forecasts daily (Sundays excepted) at 3.30 p.m. The forecasts for any district are supplied by telegraph to agriculturists and others upon prepayment of the cost of the telegrams (nine words daily, in addition to the address) for the period during which the forecasts are required. Forms of application for these forecasts can be obtained at the Office.

The Postmaster-General has sanctioned the exhibition of Forecasts at Local Post Offices, provided space is available, if the persons to whom they are addressed desire them to be so exhibited.

Transcripts of the observations.

As far as practicable the Director, upon application, will make arrangements for the transcription of the whole or a selection of the morning or evening telegraphic reports, to be sent by telegraph, in code form, to newspapers or public associations desiring

to make use of this means of accelerating the distribution of the latest information about the weather. The special terms for this service can be obtained on application to the Office.

Storm Warnings.

Storm Signals.

The Office issues notices of threatening atmospherical disturbances on or near the coasts of the British Islands (free of charge) to ports and fishing stations recommended by responsible local authorities.

The fact that one of these notices has been received at any station is made known by hoisting a black canvas cone, 3 feet high, and 3 feet wide at base, which has the appearance of a triangle when hoisted. The telegram directing the cone to be hoisted is exhibited near the signal staff.

At dusk, whenever a signal ought to be flying if it were daylight, a night signal, consisting of three lanterns hung on a triangular frame, should be hoisted in place of the cone.

The Meteorological Office supplies the canvas cone, but does not supply the lanterns. In all cases the local authorities must undertake the charges incidental to the hoisting of the signal, such as flagstaff and gear, oil, &c., and also as to the keeping of the apparatus in repair, painting, &c.

The following is a List of Stations to which Storm-warning telegrams are sent :—

Northern.

Storm Signal Stations.

Scotland, N.E.—Lerwick, Scalloway, *Dunrossness, Sumburgh Head L.H., Fair Isle L.H., Noup Head L.H., Stromness, Kirkwall, Cantick Head L.H., Holborn Head, Dunnet Head, Wick, Tarbet Ness L.H., Avoch, Inverness, Nairn, Burghead, Lossiemouth, Buckie, †Port Knockie, Cullen, Portsoy, Banff, Fraserburgh, Peterhead, †Aberdeen, Girdleness L.H.

Scotland, E.—Stonehaven, Montrose, Scurdy Ness L.H., Broughty Ferry, Dundee, St. Andrews, Anstruther, Pittenweem, Buckhaven, Methil, Wemyss West, Burntisland, *Grangemouth, Bo'ness, Granton, *Newhaven, †Leith, Fisherrow, *Dunbar, Cockburnspath, St. Abb's Head, Eyemouth.

Scotland, N.W.—Cape Wrath L.H., Stourhead L.H., Port of Ness, Stornoway, Island Glass L.H., Portnaguran.

Scotland, W.—*Glasgow, †Greenock, Rothesay, Lamlash, Carradale, Campbeltown, Mull of Cantire L.H., Rhuvaal L.H., Rhinns of Islay L.H., Ardrossan, Girvan, Ballantrae, Cairn Ryan, Corsewall Point L.H., Mull of Galloway L.H.

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* Telegrams only exhibited.

† Arrangements made for showing signals or illuminating the cone at night.

WESTERN.

Ireland, S.—Tuskar L.H., New Ross, Dunmore East, Dungarvan, Helvick Head, Minehead L.H., Youghal, Queenstown, Cork, Passage, Kinsale, Kinsale (Old Head), Galley Head L.H., Castletownshend, Fastnet Rock L.H., Brow Head, Dingle, Tralee, †Limerick, Loophead L.H., Galway.

Ireland, N.—Killybegs L.H., Tory Island L.H., Lough Swilly L.H., Rathmullen, Malin Head, Portrush, Port Ballintrae, Ballycastle.

Irish Sea.—†Belfast, *Donaghadee, Burr Point, Howth, Kingstown, Point of Ayre, Ramsey, Douglas, Silloth, Maryport, Workington, †Whitehaven, Barrow, Walney Island L.H., Morecambe, Fleetwood, Blackpool, Lytham, Preston, †Southport, Formby, Liverpool, Runcorn, Hoylake, New Brighton, New Ferry, Penmaenmawr, Port Penrhyn, Point Lynas L.H., Holyhead, South Stack L.H., Carnarvon, Port Dinorwic.

St. George's Channel.—Aberystwyth, Smalls L.H, *Milford.

Bristol Channel.—Caldy L.H., †Tenby, Pembrey, Llanelly, Swansea, Briton Ferry, Porthcawl, Nash L.H., Penarth, Cardiff (Bute Dock and Barry Dock), Newport, Weston-super-Mare, Burnham, *Bridgwater, Ilfracombe, Bull Point L.H., *Barnstaple, Appledore, Hartland Point L.H., Lundy Island, *Boscastle, Port Isaac, Newquay, Godrevy L.H., Hayle, St. Ives, St. Sennen, Newlyn West, Penzance.

SOUTHERN.

England, S.W.—Scilly, The Lizard, Falmouth, Pendennis Castle, Mevagissey, Plymouth (Mount Batten and *Millbay Docks), Devonport (Mount Wise and the †Dockyard), Prawle Point, Salcombe, Teignmouth, Exmouth.

England, S.—Guernsey, Jersey (St. Helier's), Portland L.H., Weymouth, Anvil Point L.H., Poole, Hurst Castle L.H., Southampton, Hamble, Yarmouth (I. of W.), Cowes, Ryde, St. Catherine's Point, Portsmouth (Dockyard and Noman's Fort), Littlehampton, Brighton, †Newhaven.

England, S.E.—Beachy Head, Eastbourne, †Hastings, Rye, Sandgate, Folkestone, Dover, Deal, Ramsgate, Margate, Faversham, Sheerness, Chatham, Greenhithe.

EASTERN.

England, N.E.—Berwick-on-Tweed, Cullercoats, North Shields, South Shields, Souter Point L.H., Sunderland, Hartlepool, †Middlesborough, Redcar, Whitby, Filey, Flamborough, Flamborough Head, Bridlington, Hull, *Goole, Grimsby, Boston.

England, E.—*Sutton Bridge, Lynn, Sheringham, Cromer, Great Yarmouth, Gorleston, Southwold, Orford Ness L.H., Ipswich, Harwich, Gunfleet L.H., West Mersea.

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* Telegrams only exhibited.

† Arrangements made for showing signals or illuminating the cone at night.

B.—Information Received Weekly.

Meteorological Statistics for Agricultural and Sanitary Purposes.

Weekly Weather Report, with Monthly and Annual Appendices.

Weekly Weather Report.

The Weekly Weather Report, which has been continued in its present form since 1890, is published on Thursdays, and gives, for the week ended on the preceding Saturday, a summary of temperature, rainfall, and duration of bright sunshine in the United Kingdom, for agricultural and sanitary purposes. To this is added a series of maps showing the distribution of pressure and wind over the whole of Europe at 8 a.m. and 6 p.m. on each day, and the temperature, weather, and sea disturbance at 8 a.m. each day. The maps for each day are accompanied by a brief account of the distribution of weather for that day and the changes that have taken place. Since the beginning of January, 1906, a table has been included giving the results of observations of the upper air taken by means of kites. These results include particulars as to temperature, humidity, and wind (direction and velocity) at various levels.*

For the maps and descriptive account, the daily telegraphic reports are used, and are supplemented by the information contained in the "Bulletin International" already referred to (p. 56), so that the area represented is much larger than that covered by the Daily Weather Report.

For the statistical summaries, the information from the 27 telegraphic reporting stations in the British Isles is supplemented by returns of daily observations supplied by volunteer observers from about 94 other stations. Of these 32 supply only the daily amounts of bright sunshine. The summaries refer to districts which are identical with the forecast districts of the Daily Weather Report, and they are grouped into extreme northern, eastern (wheat-producing), western (grazing), and extreme southern (Channel Islands) districts.

In the data for temperature are included not only statistics of mean and extreme temperatures for the week, but also weekly and progressive statistics of *Accumulated Temperature*, of which the following brief explanation may be given.

Tables of Accumulated Temperature.

The tables of Accumulated Temperature are designed to give persons engaged in agriculture better means for estimating the manner in which vegetation is affected by temperature than that afforded by the more usual methods of treating the readings of the thermometer. They show for each week, and for the whole period from the beginning of the year, the weekly and progressive values

* Information concerning minimum temperature on the grass and temperature in the ground has been added since the beginning of May, 1906.

respectively of the combined amount and duration of the excess or defect of the air temperature, above or below a suitably fixed standard, or *base temperature*. The base value adopted is 42° Fahr.

Accumulated Temperature is expressed in *Day-degrees*, a Day-degree signifying 1° F. of excess or defect of temperature above or below the base (42° F.) continued for 24 hours, or any other number of degrees for an inversely proportional number of hours.*

Monthly, Annual, and Quinquennial Supplements to the Weekly Weather Report.

Subscribers for the Weekly Weather Report receive also the following supplements and appendices:—

(*a*). *A Monthly Supplement* giving (1) a general account of the weather for the month under the headings—Pressure, Depressions, Anticyclones, Winds, Temperature, Rainfall, Bright Sunshine, and Observations in the Upper Air; (2) a complete summary of the observations at the Telegraphic Reporting Stations, and at certain of the Normal Climatological Stations; (3) a summary of maximum and minimum temperature, rainfall, and sunshine at the additional stations which furnish weekly returns, and at certain other Climatological Stations; (4) the differences where possible from the average pressure, temperature, rainfall and sunshine; (5) four maps showing the monthly distribution of barometer and wind, the movements of barometric depressions, the distribution of mean temperature, and the distribution of rainfall.

Beginning with January, 1902, this Monthly Summary has been enlarged, and the number for March, 1906, contains tables of results for 157 stations, namely:—27 telegraphic stations and 28 selected normal climatological stations, together with a summary of temperature, rainfall and sunshine, or one or more of these elements, at 102 other stations.

An Annual Summary on similar lines has been added since the year 1904.

(*b*). An *Appendix*, issued quarterly and annually, containing—

(1) *Quarterly and annual summaries of the rainfall and mean temperature* of each district compared with the corresponding quarter, or the whole year, for each of the last 15 years, and with each of the corresponding five-yearly means for thirty-five years;

(2) A table of the *driest* and *wettest* the *coldest* and *warmest* corresponding *quarters* and *years* since 1866;

(3) The *totals for periods of four weeks and five weeks* of rainfall, accumulated temperature and sunshine, together with the progressive totals for each period of the quarter.

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* A full explanation of the principles on which the rules for computing accumulated temperature are based will be found in Appendix II. to the Quarterly Weather Report for 1878. *See also* Journal Royal Statistical Society, Vol. LXVIII., Part II.

(*c*). An *Appendix*, issued annually, giving *weekly and progressive totals* of rain-days, rainfall, accumulated temperature, and duration of sunshine with percentage of its possible amount, for the several districts.

(*d*). An *Appendix* computed every fifth year, giving the *weekly and progressive values* of the different elements in the *five years*, and for the whole period, since 1881.

(*e*). An *Appendix* appearing every fifth year, giving for each district a comparison of the mean of the *average temperature of successive weeks for the preceding five years* with the corresponding value for the whole period defined above.

(*f*). An *Appendix*, which is also prepared every fifth year, giving the *monthly averages* of rainfall, rain-days, maximum temperature, minimum temperature, mean temperature, duration of bright sunshine and percentage of possible bright sunshine, for as many as possible of the stations included in the Weekly Weather Report.

(*g*). A special wind-force supplement (published separately), giving the readings of anemometers amounting to, or exceeding, a velocity of 44 statute miles per hour, as recorded on the "Dines" pressure tube anemometer, or upon the "Robinson" anemometer, with the factor adjusted to give the corresponding result.

Advance copy for the use of newspapers.

An advance copy of the MS. of the Report is prepared on Tuesday in each week, and is supplied free of charge to newspapers together with the weekly summary which occupies the first page of the Report.

The Report is published every Thursday afternoon by the Publishers to H.M. Stationery Office, Messrs. Wyman & Sons, Fetter Lane, E.C., Oliver & Boyd, Edinburgh, and E. Ponsonby, 116, Grafton Street, Dublin. The annual subscription is £1 10*s*., post paid. Single copies are sold at 6*d*. each, exclusive of postage, and the separate appendices are priced at from 4*d*. to 1*s*.

Copies of the Report are sent to the following public libraries and private institutions in London, viz. :—

The British Museum; Guildhall Library; Imperial Institute; Royal Botanic Gardens; Royal Society; Royal Astronomical Society; Royal Meteorological Society; The Society of Arts; Lloyd's; Royal United Service Institution; London Institution; Solar Physics Observatory; Royal Institution; General Register Office; Royal Observatory, Greenwich; Royal Naval College, Greenwich; Board of Education (Secondary Branch); Institution of Civil Engineers; Local Government Board; Board of Trade; Board of Agriculture and Fisheries; The Admiralty; British Balneological and Climatological Society;

and also to a number of provincial libraries.

C.—Other Information from Stations in the British Isles.

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ruments.

The Committee maintain a fully equipped meteorological Observatory at Valencia (Cahirciveen), Co. Kerry, Ireland. They have also established instruments and subsidised the observatories at Kew, Falmouth, and Aberdeen. They receive in return curves and hourly tabulations of pressure, dry bulb temperature, wet bulb temperature, rainfall, direction and velocity of the wind, and sunshine, together with regular observations of the character and movement of the clouds and the state of the weather.

An annual volume embodying the results of the observations at the four Observatories is issued in the usual way. That for 1903 has recently been issued, price 6*d*. per month each station.

The Office also receives, in return for an annual grant, duplicates of the curves from the self-recording instruments at Glasgow, Armagh, and Stonyhurst, and the tabulations of these curves are available if required.

Anemographic records are also received from Alnwick Castle, Deerness, Dublin, Falmouth (Pendennis Castle), Fleetwood, Holyhead, Kingstown, North Shields, Roches Point, Scilly, Shoeburyness, and Yarmouth.

The stations from which continuous records of bright sunshine, pressure, temperature, rainfall, and relative humidity are received, are indicated in the list which follows by the symbols described on pp. 70, 71.

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Normal climatological stations, equipped and maintained by volunteer observers or by local authorities at their own expense, supply monthly returns of readings of all the meteorological elements at 9 a.m. and 9 p.m. each day.

The following extract from the complete Form will show the headings under which observations are recorded :—

Twice daily (at 9 a.m. and 9 p.m.).														Once daily.										
Barometer.			Temp.		Humidity.‡		Wind.		Cloud.			Weather		Rain.	Temp.			Additional Observations.						
Attached Thermometer.	Uncorrected.	Corrected and reduced to Mean Sea level.	Dry bulb.	Wet bulb.	Dew point.	Vapour Pressure.	Percentage.	Direction.	Force (0-12).	Amount (0-10).	Form.	Direction of lower Stratum, whence coming.	At time of Observation.	Since last Observation.	At 9 a.m.	Estimated duration.	Corrected readings at 9 p.m. Max.	Corrected readings at 9 p.m. Min.	Duration of Bright Sunshine.	Weather Symbols.	Remarks.	Earth Temp. 1 ft.	Earth Temp. 4 ft.	
			Corrected.																					

‡ Deduced from readings of dry-bulb and wet-bulb.

An annual volume embodying the results of these observations is published; that for 1901 has been issued, price 22*s.* 6*d.*

Other stations.

Other Climatological Stations (including those which have already been referred to as contributing weekly returns) equipped and maintained in like manner, furnish periodical returns with less extensive information than that supplied by the normal climatological stations, or information of the same extent but with different hours of observation. Other stations furnish daily readings of sea temperature.

The names of all the stations in the British Isles from which information of any kind is received, and a statement of the order of the stations and the publication for which the returns are prepared, are given in the lists appended hereto, pp. 69 to 96.

Supply of information and charges.

The returns thus collected, whether published in the manner described or in manuscript, may be consulted or copied at the Office between 10 a.m. and 4 p.m., by any person, by permission of the Director. Extracts from them are supplied to any person making written application to the Director specifying precisely the details of the information required. For these extracts a charge is made to cover the cost of the time required for selecting and making them.

The extracts will, if required, be attested by a sworn declaration before a Commissioner for Oaths, at a fee of £1 1*s.* (in addition to the charge of 1*s.* 6*d.* made by the Commissioner for Oaths). A special fee of £2 2*s.* for each day's attendance is charged if a representative is required to attend in court in London with reference to the statements contained in the extracts supplied.

D.—Information from Land Stations outside the British Isles.

Foreign and Colonial stations.

Periodical returns are received from certain stations in different British Colonies and dependencies, or in foreign countries.

A list of the stations, stating the character of the observations taken, is given on pp. 94 to 96.

The information contained in these returns is available upon the same conditions as that contained in the returns of British Stations.

E.—The Library.

Library.

In return for copies of publications the Office receives the weather reports and other publications of the official meteorological organisations of the world, and of many private organisations.

The library has also gradually acquired a large collection of pamphlets and books bearing upon meteorological subjects. These

publications are available, free of charge, for the purposes of study and research, upon application at the Office, between the hours of 10 a.m. and 4 p.m.

F.—Marine Observations.

The information as to the meteorology of the sea collected by the Office since 1855, is contained in a large number of logs kept by the officers of the Royal Navy, or of the Mercantile Marine, and forwarded to the Office. The information is regularly discussed and arranged according to the squares of latitude and longitude, embracing 10 degrees in each direction, and again sub-divided according to one degree squares. The information is then compiled statistically, and is represented by a series of publications, of which a list is appended. *See* pp. 100 and 101.

A series of monthly Meteorological Charts of the North Atlantic and Mediterranean was commenced in April, 1901, and is still being issued. These are supplied by the Superintendents of the Mercantile Marine Offices at the principal British ports to captains and officers of merchant ships, at the price of 6*d.* each. Copies can also be obtained from the Admiralty Agents for the sale of charts and from the Agents for H.M. Stationery Office at Edinburgh and at Dublin, at the price of 5*s.* for an annual series of 12 charts, or 6*d.* for each chart, in addition to the cost of transmission.*

The marine observations are by voluntary observers. Those officers whose names are on the list of observers for the Office receive the Pilot Charts free, and also receive from time to time copies of the other marine publications issued by the Office.

G.—Supply of Instruments to Observers.

of iments.

In accordance with the terms of the Parliamentary grant the Office does not lend instruments for the use of observers except in the following cases :—

(1.) To the Captains of vessels who undertake to keep a Meteorological log during their voyage and forward it to the Office.

(2.) To the Telegraphic Reporting Stations in the British Isles.

(3.) To the First Order Stations in connexion with the Office.

(4.) To selected Stations in less frequented parts of the world where observations are deemed to be specially desirable.

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* The issue of a similar series of charts for the Indian Ocean was commenced in May, 1906.

(5.) To a limited number of fishing communities in various districts of the British Isles, which are supplied on certain conditions with suitable mercury barometers.

The outfit of instruments lent to captains of ships consists of one mercury barometer; six thermometers, with a screen; four hydrometers.

The ships are supplied either directly from the Office or through the following agents:— Mercantile Marine agents.

Cardiff—Mr. T. L. Ainsley, Bute Dock.

Dundee—Mr. C. H. Brown, 33, Dock Street.

Glasgow—D. McGregor & Co., Ltd., 37 & 38, Clyde Place.

Greenock—D. McGregor & Co., Ltd., 32, Brymner Street.

Hull—Messrs. Castle & Co., 56, Lister Street.

Liverpool—D. McGregor & Co., Ltd., 39, South Castle Street.

Southampton—Captain D. Forbes, 169, High Street.

Sunderland—Messrs. J. J. Wilson & Son, 18, Hudson Road.

Sets of instruments are kept in working order at the Office in London, and at each agency, for the purpose of instructing observers in the method of observation.

The Office possesses a number of Barometers which it is willing to lend for the use of fishing communities, where it is shown that the instrument will be of material service. As a condition of the loan the community is required to provide for the housing of the instrument and to keep and forward to the Office a record of daily readings. A copy of a manual specially compiled for the purpose accompanies the instrument, and is intended to point out in simple language the practical use of the Barometer, with a view to anticipating important changes in the weather in the neighbourhood of the fishing stations. The following is a list of stations that have been supplied with Fishery Barometers:— Fishery barometers.

LIST of STATIONS supplied with FISHERY BAROMETERS.

Shetland Isles.—*Balta Sound, Uya Sound, Burravoe, Nesting, Lerwick, Sandwick, Scalloway, Symbister, Hamnavoe, Walls.

Orkney Isles.—*Westray, Papa Westray, *Burray, *Kirkwall.

Scotland, East coast.—*Duncansbay, *Freswick, *Auchengill, *Keiss, *Ackergill, *Staxigoe, *Wick, *Lybster, *Dunbeath, *Inver, *Portnahomack, *Ballintore, *Cromarty, *Avoch, *Nairn, *Burghead, *Portessie, *Port Knockie, *Portsoy, *Whitehills, *Gardenstown, *Rosehearty, Pitullie, *Fraserburgh, *Inverallochy, Pointlaw, Portlethen, *Skateraw, *Stonehaven, *Arbroath, *East Haven, *Broughty Ferry, *St. Andrews, *Crail, *Cellardyke, *St. Monance, *Burntisland, Newhaven.

England, East coast.—*Berwick, *North Shields, *South Shields, *Sunderland (Roker), *West Hartlepool, *Staithes, *Scarborough, *Filey, *Flamborough, *Bridlington Quay, *Withernsea, *Hull, *Lynn (2), *Wells, *Gorleston, *Lowestoft, *Wilberswick, *Harwich, *Brightlingsea, *West Mersea, *Maldon, *Leigh, *Margate, *Deal, *Kingsdown, *Dover.

England, South coast.—*Bognor, *Ryde, *Bembridge, *Brixton, *Atherfield, *Ventnor, *Yarmouth (Isle of Wight), Gorey (Jersey), *Haslar Hospital, *Poole, *Weymouth, *Portland.

England, South-West coast.—*Budleigh Salterton, *Exmouth, *Cawsand, *Mevagissey, *Gorranhaven, *Devoran, *Portscatho, *Penryn, *Durgan, *Porthallow, *Falmouth, *Coverack, *Newlyn (2), *Mousehole, *Penberth Cove, *Porth Guarra,* St. Ives, *Hayle, *Port Isaac, *Bideford, Burnham, Highbridge, Weston-super-Mare.

Wales.—*Briton Ferry, *Swansea, *Angle, *Milford, *Aberystwyth, *Carnarvon, Pwllheli.

England, North - West coast.—*Fleetwood, *Morecambe, *Maryport.

Isle of Man.—Douglas, Port St. Mary, Peel (2).

Scotland, South-West coast.—*Port Patrick, *Cairn Ryan, *Port William.

Ireland, East coast.—Cushendall, Belfast, Bangor, Groomsport, Donaghadee, Ardglass, Warren Point, Carlingford, Glenarm, Greenore, Dundalk, Malahide, Howth, Kingstown (2), Bray, Wicklow.

Ireland, South coast.—Dunmore East, Dungarvan, Crosshaven, Kinsale, Union Hall, Castletownshend, Baltimore, Schull (2), Crookhaven, Castletown (Berehaven), Lawrence Cove, Ballydonegan, Ballycrovane.

Ireland, West coast.—Valencia, Dingle, Tralee, Ballyheigue, Tarbert, *Kilcredane, Kilronan, Galway, Spiddal, Cleggan, Elly Bay, Ballyglass, Ballycastle (Co. Mayo), Mullaghmore, Donegal, Tribane, Killybegs, Teelin, Malinmore, Port Noo, Rosbeg, Burton Port, Kincashla, Bunbeg, Inniscoo Island.

Ireland, North coast.—Dunfanaghy, Rathmullen, Buncrana, Malin Head, Moville, Greencastle, *Port Stewart, *Portrush, *Port Ballintrae, *Ballycastle (Co. Antrim).

Scotland, West coast.—*Lamlash, *Tarbert (Loch Fyne), *Loch Ranza, *Campbeltown, *Carradale; *Portnahaven, *Port Wemyss, and *Bowmore (Islay); *Mallaig; *Portree and *Armadale (Isle of Skye); *Isle of Soay, *Kyle of Lochalsh, *Plockton, *Ardneaskan, Shieldaig, Gruinard, Badachro, Ullapool, *East Mey, *Gills, *Stroma (2).

Hebrides.—Ness, Carloway, Marvaig, Crossbost, Stornoway, Portnaguran, Valtos, Obb, Bernera, *Boreray.

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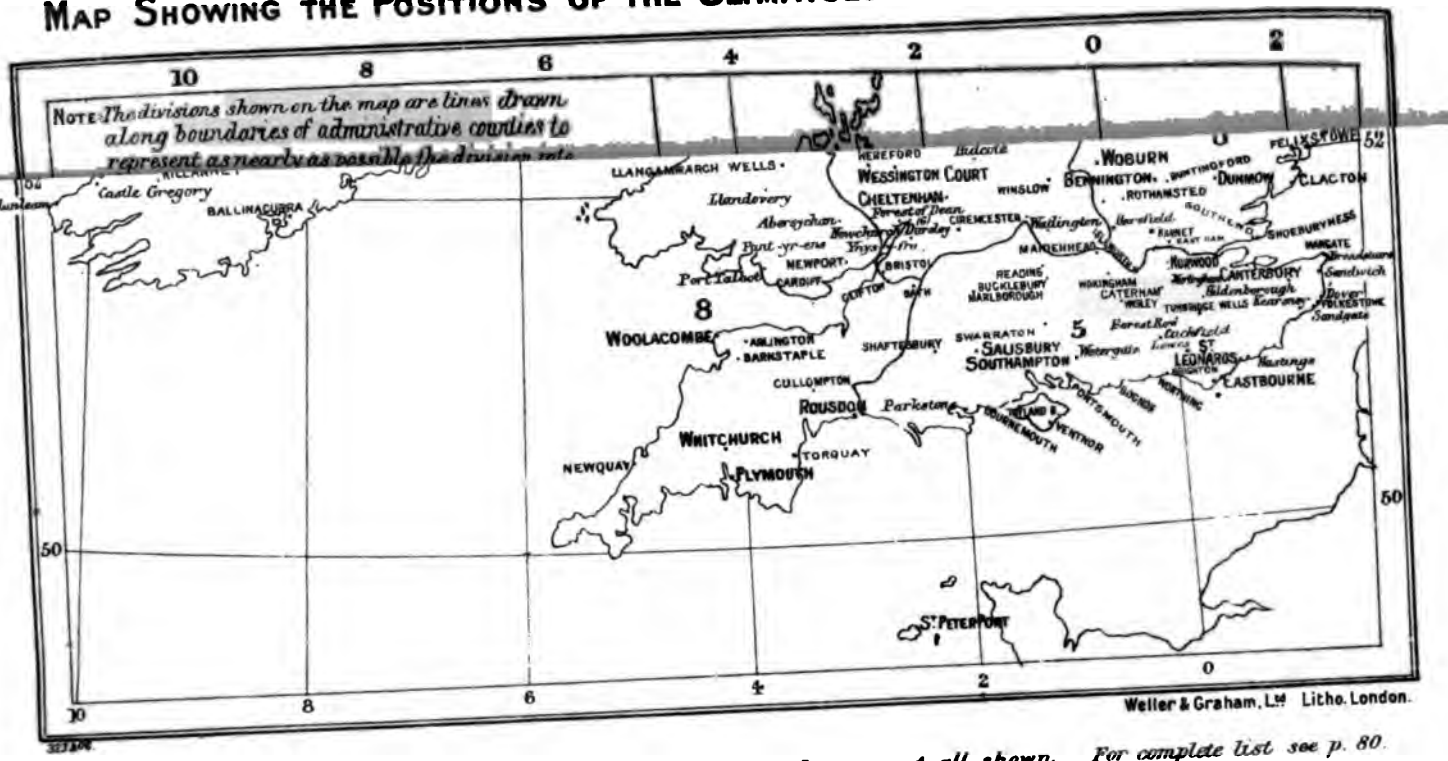
* The Director has been in correspondence with the Fishery Boards concerning these stations.

[Plate III. between pp. 68 and 69.]

REPORT OF METEOROLOGICAL COMMITTEE 1905-1906.

MAP SHOWING THE POSITIONS OF THE CLIMATOLOGICAL AND RAINFALL STATIONS.



The Stations in the County of London are not all shown. *For complete list see p. 80.*

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Supply of instruments on commission for observers at Land Stations.

The Director is authorised to supply, at a cost of 5 per cent. in addition to the contract prices and the cost of carriage, trustworthy instruments for standard meteorological observations to those who are willing to send copies of their observations to the Office. The risk of breakage in transit must be undertaken by the consignee. The Director will also supply, free of cost, blank registers for the returns of the observations and, subject to certain conditions, forms for anemographs and sunshine recorders, and will, if desired, give advice about the site and exposure of the instruments.

For further information as to the supply of instruments, application should be made to the Office.

H.—List of Stations in the British Isles in connexion with the Meteorological Office.

The returns from stations marked "S" are supplied by the Scottish Meteorological Society, those marked "R" by the Royal Meteorological Society.

The list shows the order of the stations and also the publication for which the returns are prepared in the Office. In specifying the order of the station a distinction has been drawn between eye observations and the records of autographic instruments. The returns received have in general formed the basis for the classification, but in cases in which more extensive observations are taken but not forwarded to the Office, the corresponding symbol has been enclosed in brackets. The list makes no pretence to completeness in this respect. The symbols used may be explained as follows:—

I. Observatory: Station of the First Order.—Continuous records or hourly readings of pressure, temperature, wind, sunshine, and rain, with eye observations of the amount, form, and motion of the clouds, and notes on the weather. The autographic records are checked by frequent eye observations, and hence the symbol I has been entered in the table under both "Eye observations" and "Continuous records."

II. Normal Climatological Station: Station of the Second Order.—Daily observations at 9 a.m. and 9 p.m. local time (or other accepted combinations of hours), of pressure, temperature (wet and dry-bulb), wind, amount of cloud, and weather, with the daily maximum and minimum of temperature, the daily rainfall, and remarks on the weather.

III. Auxiliary Climatological Station: Station of the Third Order.—Observations similar in kind to those at the

Normal Stations, but either (*a*) less full, (*b*) taken only once daily, (*c*) taken at hours other than 9 a.m. and 9 p.m.

T. Telegraphic Reporting Station.—Daily observations at 8 a.m. and 6 p.m. G.M.T. (and in some cases also at 2 p.m.), similar in general character to those taken at Normal Climatological Stations, reported to the Office each day by telegraph.

●. (Eye Observations.) Additional Rainfall Station.—Daily observations, generally at 9 a.m., of the amount of rainfall.

✓. Additional Anemograph Station.—Continuous records of wind velocity (force) and, in most cases, also of wind direction.

B. Additional Barograph Station.—Continuous record of atmospheric pressure.

Θ. Additional Thermograph Station.—Continuous record of atmospheric temperature.

●. (Self-recording.) Additional Autographic Raingauge Station.—Continuous record of rainfall.

H. Hygrograph Station.—Continuous record of the relative humidity of the air.

⊙. Sunshine Station.—Continuous record of bright sunshine taken with a Campbell-Stokes recorder.

The publications for which the returns are prepared are indicated by the following letters :—

D. Published *in extenso* in the "Daily Weather Report."

d. Published in abridged form in the "Daily Weather Report."

W. Weekly summary of temperature and rainfall and, if available, of sunshine, published in the "Weekly Weather Report."

w. Weekly total of bright sunshine only, published in the "Weekly Weather Report."

M. Full monthly summary in the international form published in the Monthly Summary to the "Weekly Weather Report."

m. Abridged monthly summary published in the Monthly Summary to the "Weekly Weather Report."

(m.) Monthly totals of bright sunshine only, published in the Monthly Summary to the "Weekly Weather Report."

S. Daily values published in "Meteorological Observations at Stations of the Second Order" (1901).

s. Monthly summaries published in "Meteorological Observations at Stations of the Second Order" (1901).

R. Monthly summary published in the Reports of the Registrar General of Births, Deaths, and Marriages, for England and Wales, or for Ireland.

r. Weekly summary published in the Reports of the Registrar General for England and Wales, or for Ireland.

Height above Mean Sea Level.—The figures given in this column refer in general to the height of the ground on which the rain gauge stands. At those stations which do not possess a rain gauge, the figures refer to the height of the particular instrument in use.

*** From a number of stations in the British Isles printed summaries of observations are received. These have been included on p. 132 in the Geographical list of Institutions, &c., which issue publications.

The following make monthly returns in a form similar to that in which observations are received from the normal or auxiliary climatological stations:—

Bolton.—The Museums and Meteorological Observatory.

Croydon.—Natural History Society.

Northampton.—Natural History Society.

Southport.—Fernley Observatory.

Truro.—Cornwall County Council Sanitary Committee.

List of Stations arranged according to Districts and Counties.

The Counties are grouped in Districts which are numbered as follows :—

0. Scotland, N.
1. Scotland, E.
2. England, N.E.
3. England, E.
4. Midland Counties.
5. England, S., and English Channel.
6. Scotland, W. (including the Isle of Man).
7. England, N.W., and North Wales.
8. South Wales, and England, S.W.
9. Ireland, N.
10. Ireland, S.

County and Station		Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
					Eye Obs.	Self-recording.			
0. SCOTLAND, NORTH.									
Caithness :—	Sandside, Reay.	° ′ 58 34	° ′ 3 48 W.	55	●	—	—	—	D. Macaulay.
	Wick	58 27	3 6 W.	80	T	—	D.W.M	05	Miss Sinclair, for M.O.
Cromarty :—	StrathpefferSpa	57 37	4 28 W.	253	II	⊙	w.M.s	06	J. Mclean, for R. Fortescue Fox, M.D.
Inverness :—	*Fort Augustus	57 8	4 40 W.	68	II	⊙	W.m.s.	04	Rev. C. von Dieckhoff.
	*Fort William...	56 49	5 7 W.	175	III	—	W.m s.	04	W. T. Kilgour.
Orkney :—	Deerness ...	58 56	2 45 W.	160	II	◢ ⊙	w.M.S.	05	M. Spence.
Ross :—	Ardross Castle	57 45	4 21 W.	449	●	—	—	—	W. Minty.
	*Glencarron ...	57 30	5 14 W.	489	II	—	W.m.s.	03	D. D. Munro, for Lord Maclaren.
	Kinlochewe ...	57 36	5 24 W.	—	●	—	—	—	A. McLennan, for Hon. W. Peel, M.P.
	Stornoway ...	58 11	6 22 W.	40	T	B ⊙	D.W.M.	05	J. Mackenzie, Lloyd's Agent, for M.O.
Shetlands :—	Sumburgh Head.	59 51	1 17 W.	112	T	B	D.W.M.	04	Rev. W. Brand, for M.O.
Sutherland :—	*Dunrobin Castle.	57 59	3 56 W.	12	II	—	S.	05	D. Melville, for the Duke of Sutherland, K.G.
	*Lairg	58 2	4 24 W.	387	II	—	W.m.s.	05	Rev. John K. Maclean, M.A.

1. SCOTLAND, EAST.									
Aberdeen :—	Aberdeen Observatory.	57 10	2 6 W.	46	I, T	I, B	D.W.M.s.	05	Professor C. Niven, F.R.S., and G. A. Clarke, for M.O.
	§Balmoral ...	57 2	3 12 W.	920	II	—	W.m.	—	J. Michie, M.V.O., and John M. Troup.
	§*Braemar* ...	57 0	3 24 W.	1,111	II	—	W.m.S.	05	J. Aitken, J.P.
Banff :—	§Gordon Castle	57 37	3 5 W.	101	II	—	s.	03	C. Webster, for the Duke of Richmond and Gordon, K.G.
Berwick :—	§Marchmont ...	55 44	2 25 W.	498	II	⊙	W.m.s.	02	J. A. Wood, for Sir H. P. Campbell, Bart.
Clackmannan :—	No station.								
Edinburgh :—	Edinburgh ...	55 57	3 12 W.	253	—	⊙	(m.)	—	The Regius Keeper, Royal Botanic Garden.
	Leith	55 58	3 10 W.	18	T	—	D.W.M.	05	D. Drummond, Post Office, for M.O.
Elgin :—	No station.								
Fife :—	No station.								
Forfar :—	§Dundee ...	56 28	2 56 W.	160	II	—	S.	05	J. Carnochan.
	§Lednathie ...	56 45	3 7 W.	719	II	—	s.	03	W. Morrison, for P. Stormonth Darling.
Haddington :—	No station.								
Kincardine :—	Crathes ...	57 3	2 25 W.	140	II	⊙ θ	w.m.	04	J. Smith.
Kinross :—	No station.								
Linlithgow :—	No station.								
Nairn :—	Nairn	57 36	3 52 W.	82	T	—	D.W.M.	05	Miss Penny, for M.O.
Peebles :—	No station.								
Perth :—	§Clathick ...	56 24	3 53 W.	296	II	—	W.m.	05	Alex. Hendry.
	Forgandenny...	56 21	3 29 W.	175	—	B ●	—	—	C. L. Wood.
	Balruddery ...	56 29	3 8 W.	276	—	⊙	w. (m.)	04	G. Davie, for J. White.
Roxburgh :—	§Wolfelee ...	55 23	2 39 W.	587	II	—	s.	05	Thos. Arthur, for Major Elliot.
Selkirk :—	No station.								

The names of Stations added to the list since April, 1905, are printed in clarendon type; those of Stations now discontinued are printed in italic type.

LIST OF STATIONS ARRANGED ACCORDING TO DISTRICTS AND COUNTIES—*continued.*

County and Station.		Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
					Eye Obs.	Self-recording.			
2. ENGLAND, NORTH EAST.									
Durham :—	Durham ...	54 46	1 35 W.	336	II	⊙	W.M.s.R.	03	Prof. R. A. Sampson, M.A., F.R.S.
	Seaham Harbour.	54 50	1 19 W.	139	II	—	m.s.	05	G. H. Aird.
Lincolnshire :—	Caistor	53 30	0 20 W.	266	●	—	—	04	Thos. Ford.
	Fulbeck ...	53 3	0 37 W.	180	II	B	W.m.	04	Rev. Vere F. Willson, M.A.
	Lincoln... ...	53 14	0 33 W.	58	II	—	W.M.	05	S. R. Moss, for the Corporation.
	Mareham - le - Fen.	53 8	0 5 W.	10	●	—	—	01	Mrs. G. L. Kime.
	Rauceby Hall ...	53 0	0 29 W.	124	III	⊙	w.m.	03	J. Hope, for General Sir M. Willson, K.C.B.
	Skegness ...	53 9	0 21 E.	12	III	⊙	d.w.m.	04	S. Coetmore Jones, for the District Council.
	Tealby	53 24	0 16 W.	251	II	—	s.R.	03	Rev. S. Lewin, B.A.
	Temple Bruer...	53 4	0 30 W.	—	●	—	—	03	Miss Alice S. Morley.
Northumberland :—	Alnwick Castle	55 25	1 43 W.	210	III	◢	W.m.	03	Robert Kyle, for the Duke of Northumberland, K.G.
	Cockle Park, Morpeth.	55 13	1 41 W.	324	II	⊙	w.M.S.R.	04	A. G. Birt, for the Northumberland County Council.
	Font Watershed—								
	Chertners ...	55 16	2 0 W.	1,000	●	—	—	—	Francis R. Hull, C.E.
	Dam Site ...	55 14	1 54 W.	620	●	—	—	—	" "
	Fallowlees ...	55 15	1 57 W.	850	●	—	—	—	" "
	Red Path ...	55 13	2 0 W.	850	●	—	—	—	" "
	Tod Crag ...	55 15	2 1 W.	1,000	●	—	—	—	" "
	Newcastle - on - Tyne.	54 59	1 36 W.	152	III	⊙	w.m.	03	N. H. Martin, F.R.S.E, F.C.S.

	North Shields	55	0	1	27 W.	96	T	—	D.W.M.R.r.	05	R. Moat, Post Office, for M.O.
	„ High Lighthouse.	55	0	1	27 W.	—	—	◢	—	05	Capt. T. Robson, for M.O.
Yorkshire, N. Riding:—	Ampleforth ...	54	12	1	6 W.	349	II	—	m.	03	Rev. J. B. McLaughlin, B.A., O.S.B.
	Hovingham Hall	54	10	0	59 W.	120	●	—	—	—	Bingley Day, for Sir W. H. A. Worsley, Bart.
	Rounton ...	54	24	1	18 W.	242	II	—	s.	05	Sir Hugh Bell, Bart.
	Saltburn-by-the-Sea.	54	35	0	58 W.	116	III	⊙	w.m.	05	J. Allan Bennett, M.D.
	Scarborough ...	54	18	0	24 W.	62	II	⊙	d.W.m.S.	05	W. W. Larkin, for the Corporation.
	Whitby ...	54	29	0	37 W.	88	II	⊙	M.	05	Thos. Newbitt.
	York. Deighton Grove.	53	54	1	3 W.	38	●	—	—	05	Miss M. L. Whitehead.
	„ The Museum.	53	57	1	5 W.	56	II	—	W.M.s.R.	05	Oxley Grabham, M.A.
	„ Bootham	53	57	1	5 W.	105	—	⊙	w.(m.)R.	05	Hugh Richardson, M.A.
	„ The Mount	53	56	1	5 W.	—	—	⊙	—	—	R. Thompson.
Yorkshire, E. Riding:—	Hull ...	53	45	0	16 W.	0	II	⊙	R.r.	04	H. B. Witty, for the Corporation.
	Spurn Head ...	53	34	0	7 E.	26	T	—	D.W.M.R.	05	A. S. Badcock and W. J. Counter, for M.O.
3. ENGLAND, EAST.											
Bedford:—	Aspley Guise ...	52	1	0	38 W.	410	—	⊙	—	—	Mrs. Dymond.
	Woburn, Ridgmont.	52	1	0	36 W.	291	II	—	M.s.	05	H. M. Freear, F.C.S., for the Royal Agricultural Society.
Cambridge:—	Cambridge Bot. Gardens.	52	12	0	8 E.	41	II	⊙ ●	W.M.S.R.	03	R. Irwin Lynch, M.A.
	„ The Observatory.	52	13	0	6 E.	83	—	B	—	05	A. R. Hinks, M.A., for Sir Robert Ball, F.R.S.

The names of Stations added to the list since April, 1905, are printed in clarendon type; those of Stations now discontinued are printed in italic type.

LIST OF STATIONS ARRANGED ACCORDING TO DISTRICTS AND COUNTIES—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Self-recording.			
3. ENGLAND, EAST—*cont.*								
Cambridge —*cont.* Cambridge, Newnham Coll.	52° 13′	0° 5′ E.	—	III	H	—	05	Miss Stephen.
Essex:— Clacton-on-Sea ...	51 47	1 9 E.	54	T, II	⊙	D.W.M R.	04	A. W. Shadick, for Urban District Council.
Dunmow ...	51 53	0 23 E.	297	II	⊙	w.M.R.	04	Thos. Hacking, for the Countess of Warwick's Agricultural School.
East Ham ...	51 32	0 3 E.	12	III	●	—	—	J. Banks, for the Corporation.
Shoeburyness ...	51 32	0 47 E.	13*	III	◢	W.m.	04	The Superintendent of Experiments.
Southend-on-Sea.	51 32	0 43 E.	100	III	⊙	w.m.	—	E. J. Elford, for the Corporation.
,, Waterworks	51 32	0 43 E.	110	●	—	—	—	C. S. Bilham.
Hertford:— Bennington ...	51 54	0 5 W.	407	II	—	s.R.	03	Rev. J. Dunne Parker, LL.D.
Berkhamsted ...	51 46	0 34 W.	400	II	⊙ (I)	s.R.	03	E. Mawley.
Buntingford ...	51 56	0 0 W.	314	III	—	m.	05	Dr. G. M. Smith.
Rothamsted ...	51 48	0 22 W.	424	III	⊙	W.m.	02	A. D. Hall, M.A., for the Lawes Agricultural Trust.
Huntingdon:— No station.								
Middlesex:— Barnet	51 39	0 10 W.	211	III	—	R.	05	T. H. Martin, A.M.I C.E.
Harefield ...	51 36	0 29 W.	337	●	—	—	—	G. Eland.
Isleworth ...	51 29	0 20 W.	24	III	⊖	—	—	A. Worsley.
Norfolk:— Cromer	52 56	1 17 E.	196	II	⊙	w.m.	02	W. H. Archer, for Urban District Council.
East Dereham ...	52 41	0 57 E.	158	●	—	—	—	G. H. Cooper.
Geldeston ...	52 28	1 31 E.	37	II	⊙ (B ⊖)	W.m.s.	04	E. T. Dowson.
Hillington ...	52 48	0 33 E.	88	II	⊙	W.m.S.R.	05	Rev. H. E. B. Ffolkes, M A.

	Hunstanton ...	52 57	0 31 E.	29	●	—	—	—	C. Ernest Gray.
	Norwich ...	*52 37*	*1 17 E.*	*93*	*III*	—	R.r.	03	A. W. Preston.
	Thetford ...	52 25	0 45 E.	169	●	—	—	—	E. S. Greenwood.
	Yarmouth ...	52 37	1 43 E.	9	T	B	D.W.M.	04	G. T. Watson, Sailors' Home, for M.O.
Suffolk :—	Brandon ...	52 27	0 37 E.	48	●	—	—	—	Lt.-Col. B. Spragge, D.S.O.
	Felixstowe ...	51 58	1 22 E.	10	III	⊙	W.m.	05	J. Mills, for the Corporation, and S. Alexander.
	Lowestoft ...	52 29	1 45 E.	84	II	⊙	w.m.s.R.	05	C. W. Edwards, for the Corporation.
4. MIDLAND COUNTIES.									
Buckingham :—	Winslow ...	51 57	0 53 W.	379	III	—	—	—	R. A. Easton.
Derby :—	Buxton	53 14	1 54 W.	987	II	—	s.R.	05	W. Pilkington.
	Chatsworth ...	53 14	1 37 W.	—	III	B θ	—	02	The Duke of Devonshire, K.G.
Gloucester :—	Bristol, Over Court Park.	51 32	2 35 W.	147	III	—	r.	04	R. C. Cann Lippincott.
	„ Clifton College.	51 27	2 37 W.	229	III	—	W.R.m.	05	D. Rintoul, M.A.
	Cheltenham ...	51 54	2 3 W.	184	II	—	s.R.	04	A. C. Saxby, for the Corporation.
	Cirencester ...	51 43	1 57 W.	446	III	⊙	W.m.	05	Profs. G. T. Locke and P. G. Gundry, Ph.D., for the Royal Agricultural College.
	Dursley	51 41	2 21 W.	256	●	—	—	96	J. Richards.
	Forest of Dean :—								
	Blakeney Hill ...	51 46	2 30 W.	500?	●	—	—	—	J. Tyler, for Philip Baylis, Esq.
	Braceland ...	51 49	2 38 W.	500	●	—	—	—	E. A. Popert „ „
	Edgehills Lodge	51 51	2 29 W.	700	●	—	—	—	Campbell Anderson „ „
	Ruardean Hill ...	51 50	2 32 W.	900	●	—	m.	05	John Morris „ „
	Whitemead Park	51 46	2 34 W.	200	●	—	m.	05	Kate Roberts „ „
	Worcester Lodge	51 48	2 35 W.	550	●	—	—	—	Fred Morris „ „
	Hidcote	52 5	1 46 W.	524	●	—	—	97	Major W. Wright, R.A.

The names of Stations added to the list since April, 1905, are printed in clarendon type; those of stations now discontinued are printed in italic type

* Head of Anemometer 103 ft. above M.S.L.

LIST OF STATIONS ARRANGED ACCORDING TO DISTRICTS AND COUNTIES—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Self-recording.			
4. MIDLAND COUNTIES—*cont.*								
Hereford:— Hereford ...	52 5	2 45 W.	291	III	—	W.m.	04	Rev. F. B. Harrington, O.S.B.
Wessington Court	52 1	2 35 W.	439	II	—	M.s.	03	S. Lomas, for Miss L. Grafton.
Leicester:— Belvoir Castle ...	52 54	0 47 W.	259	II	⊙	R.s.	02	W. H. Divers, for the Duke of Rutland, K.G.
Syston	52 43	1 5 W.	178	●	—	—	96	S. K. Daniels.
Northampton:— Colly Weston ...	52 37	0 31 W.	281	III	—	W.m.	04	Miss A. Tasker.
Great Billing ...	52 16	0 50 W.	273	●	—	—	—	Rev. G. H. Mullins, M.A.
Oundle (The School).	52 29	0 28 W.	144	III	⊙	w.m.	04	J. O. Morris and W. T. Kitching, for F. W. Sanderson, M.A., Headmaster.
„ ...	52 29	0 28 W.	146	●	—	—	04	N. E. Dixon, C.E.
Nottingham:— Bawtry, Hesley Hall.	53 27	1 4 W.	65	III	—	W.m.	04	B. I. Whitaker, J.P.
Kingston-on-Soar.	52 51	1 14 W.	125	III	—	—	—	Fred Wakerly.
Nottingham, The Castle.	52 57	1 9 W.	192	III	—	D.W.M.R.r.	05	Arthur Brown, M.Inst.C.E., and Philip Boobbyer, for the Corporation.
„ The Pumping Station.	52 56	1 9 W.	82	T	⊙ (◢ B ●)	D.W.M.R.r.	05	„ „ „
Worksop ...	53 22	1 5 W.	56	—	⊙ (B ●)	w.(m.)	96	H. Mellish, J.P.
Oxford:— Oxford	51 46	1 16 W.	208	I, T	I	D.W.M.R.	05	Dr. A. A. Rambaut, M.A., F.R.S.; W. Wickham, for M.O.

	Watlington Park.	51 38	1 1 W.	749	●	—	—	—	G. H. Bonner.
Rutland :—	Ridlington ...	52 37	0 45 W.	522	●	—	—	—	N. W. Wortley.
Shropshire :—	Shrewsbury ...	52 43	2 45 W	191	II	—	W.M.R.	04	Capt. W. E. Manser, R.E.
	Stokesay ...	52 26	2 52 W.	370	II	—	s.R.	05	Rev W. M. D. La Touche, B.A.
Stafford :—	Cheadle ...	52 58	1 57 W.	646	II	—	W.m.s.	05	J. C. Philips.
	Hoar Cross ...	52 48	1 49 W.	396	●	—	—	—	F. W. Lycett.
Warwick :—	Birmingham, Edgbaston.	52 28	1 56 W.	535	II	⊙	d.W.M.s.R.r.	05	Alfred Cresswell, for the Midland Institute.
	Coventry ...	52 25	1 30 W.	270	III	⊙	R.	04	E. Hugh Snell, M.D., for the Corporation.
	Rugby School ...	52 22	1 15 W.	379	III	—	m.	04	O. M. Samson, M.A.
Worcester :—	Rochford ...	52 18	2 36 W.	315	●	B	—	01	Rev. John Tomson.
Yorkshire, W. Riding :—	Ackworth ...	53 39	1 20 W.	120	II	—	—	03	E. J. Ludlam, M.Sc.
	Bradford ...	53 48	1 45 W.	330	III	⊙	r.	03	H. A. Johnson, M.Inst. C.E.
	Garforth ...	53 48	1 22 W.	195	II	⊙	M.	04	Prof. Seton, B.Sc., for the University of Leeds.
	Giggleswick ...	54 4	2 17 W.	500?	III	(B)	—	05	C. F Mott, M.A.
	Harrogate ...	54 0	1 33 W.	476	III	⊙	d.W.m.	02	G. Paul, for the Corporation.
	Huddersfield .	53 39	1 47 W.	409	III	⊙	r.	05	J. Firth, Registrar.
	Leeds	53 48	1 33 W.	132	III	(B)	r.	04	H. Crowther.
	Sheffield... ...	53 23	1 29 W.	429	II	⊙	w.M.s R.	02	E. Howarth, F.R.A.S.
	„ Attercliffe.	53 24	1 25 W.	—	—	⊙	—	02	J. Robertson, M.D., B.Sc., for the Corporation.
	Wakefield ...	53 41	1 30 W.	96	II	—	s.R.	05	A. Clyde.

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LIST OF STATIONS ARRANGED ACCORDING TO DISTRICTS AND COUNTIES—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Self-recording.			
London								
County :—*Brixton*	51° 27′	0° 8′ W.	77	III	—	W.M.R.	02	F. Gaster, for M.O.
Camberwell—								
The Green ...	51 28	0 5 W.	17	—	●	—	03	W. Oxtoby, M.I.C.E., for the Camberwell Borough Council.
Dulwich ...	51 27	0 5 W.	58	—	●	—	—	
Forest Hill ..	51 26	0 4 W.	160	—	●	—	03	
Leyton Square	51 29	0 4 W.	14	—	●	—	03	
Peckham Rd.	51 28	0 5 W.	21	—	●	—	03	
Camden Square	51 33	0 8 W.	110	II	⊙ (B ●)	R.	—	H. Robert Mill, D.Sc., LL.D.
Chelsea... ...	51 29	0 10 W.	24	●	—	—	—	T. W. E. Higgens, C.E., for the Chelsea Borough Council.
City	51 31	0 5 W.	80	—	⊙	w.(m.)	—	Messrs. De la Rue.
Greenwich ...	51 28	0 0	155	I	I	R.r.	—	The Astronomer Royal.
Hampstead ...	51 34	0 10 W.	—	—	B	—	—	H. R. Beeton.
Pall Mall ...	51 30	0 7 W.	—	—	B	—	—	Athenæum Club.
Norwood ...	51 26	0 6 W.	220	II	—	s.R.	03	W. Marriott (Asst. Sec., Royal Met. Soc.).
Plumstead ...	51 29	0 6 E.	300	—	⊙	—	01	J. G. Waller.
Westminster ...	51 30	0 8 W.	27	T	● B ⊖	D.W.M.R.	05	The Staff of the Meteorological Office.
„ Training Coll.	51 30	0 8 W.	107	—	⊙	D.W.M.R.	05	J. H. Cowham.
5. ENGLAND, SOUTH, AND ENGLISH CHANNEL.								
Berkshire :— Bucklebury Place.	51 26	1 24 W.	409	III	—	—	05	J. W. Harris, for A. W. Sutton.

	Reading ...	51 26	0 57 W.	201	III					
	Wokingham, Sanatorium.	**51 26**	**0 48 W.**	**216**	**III**	**B**	**m.**	**04**	**J. Ridges, M.A.**	
								03	The Medical Superintendent.	
Dorset :—	Parkstone ...	50 43	1 56 W.	197	●	—	—	00	C. Mabey.	
	Portland Bill ...	50 32	2 27 W.	19	T	—	D.W.M.R.	05	W. J. Batton and W. H. Taylor, Lightkeepers, for M.O.	
	Shaftesbury ...	51 1	2 12 W.	722	III	—	W.m.	04	Rev. F. Ehlvers.	
Hampshire :—	Bournemouth ...	50 43	1 53 W.	140?	III	⊙	d.w.m.	02	C. Dales, for Town Council.	
	Portsmouth ...	50 48	1 6 W.	11	III	⊙	R.r.	05	A. Mearns Fraser, M.D., for the Corporation.	
	Southampton ...	50 55	1 24 W.	78	II	⊙	W.M.S.R.	04	A. Vaughan, for Director-General of Ordnance Survey.	
	Swarraton ...	51 8	1 11 W.	310	III	—	W.m.	03	Rev. W. L. W. Eyre, M.A.	
	Totland Bay ...	50 41	1 33 W.	84	III	⊙	m.	04	J. Dover, M.A.	
	Ventnor ...	50 36	1 13 W.	80	III	⊙	w.m.R.	04	Miss M. Gibson, for Royal National Hospital for Consumption.	
Kent :—	Broadstairs ...	51 21	1 26 E.	140	●	⊙	d.(m.)	—	W. H. White and Rev. H. C. V. Snowdon, for District Council.	
	Canterbury ...	51 17	1 5 E.	39	II	⊙	R.	05	A. Lander.	
	Dover	51 7	1 18 E.	198	●	—	—	96	H. E. Stilgoe, C.E.	
	Dungeness ...	50 55	0 58 E.	21	T	—	D.W.M.	05	W. Pender and W. C. Lewis, Lightkeepers, for M.O.	
	Folkestone ...	51 5	1 11 E.	121	III	⊙ (●)	d.m.	05	A. R. Nichols, M.Inst.C.E., for the Corporation.	
	Hildenborough	51 13	0 15 E.	160	●	—	—	—	Charles H. Scott.	
	Kearsney Abbey	51 8	1 17 E.	100?	●	—	—	96	*The late* C. W. Curtis, J.P., and Mrs. Curtis.	
	„ Chilton Farm.	51 8	1 17 E.	125	●	—	—	—	H. E. Stilgoe, C.E.	
	Littlestone-on-Sea.	50 59	0 59 E.	—	—	⊙	d.w.(m.)	05	H. T. Tubbs.	
	Margate ...	51 24	1 24 E.	83	III	⊙	d.w.m.	03	J. Stokes, J.P.	
	Ramsgate ...	51 20	1 25 E.	—	—	⊙	w.(m.)	04	T. G. Taylor, C.E., for the Corporation.	

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List of Stations arranged according to Districts and Counties—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Self-recording.			
5. ENGLAND, SOUTH, AND ENGLISH CHANNEL—*cont.*								
Kent—*cont.* Sandgate ...	51 4	1 9 E.	50	●	—	—	99	A. Robert Bowles, C.E.
Sandwich ...	51 17	1 20 E.	6	●	—	—	03	Royal St. George's Golf Club.
Tunbridge Wells	51 8	0 16 E.	421	III	⊙	W.m.	—	F. G. Smart, M.B.
Surrey :— Caterham ...	51 17	0 5 W.	606	III	—	—	03	P. E. Campbell, M.B.
Epsom	51 20	0 17 W.	160	III	—	m.	—	S. C. Russell.
Kew	51 28	0 19 W.	18	I	I	w.m.s.R.	05	C. Chree, Sc.D., F.R.S., Superintendent of the Observatory Department, National Physical Laboratory, for the Meteorological Office.
Oxshott ...	51 20	0 15 W.	200	—	(B)	—	—	W. H. Dines, B.A., F.R.S.
Warlingham ...	51 18	0 3 W.	609	●	—	—	—	R. H. Curtis.
Wisley	51 17	0 26 W.	150	III	⊙	W.m.	03	The Superintendent, for the Royal Horticultural Society.
Sussex :— Bognor... ...	50 47	0 40 W.	20	III	⊙	d.w.m.	—	H. C. L. Morris, M.B., and A. G. Thompson.
Brighton ...	50 49	0 8 W.	31	III	⊙	d.w.m.R.r.	08	A. Newsholme, M.D., for the Corporation.
Cuckfield ...	51 1	0 9 W.	389	●	—	—	97	John Howe.
Eastbourne ...	50 46	0 17 E.	39	II	⊙	d.w.m.s.R.	05	R. Sheward, and S. R. Henderson, for the Medical Officer of Health.
Forest Row ...	51 7	0 2 E.	619	●	—	—	—	Rt. Hon. J. Bryce, D.C.L., M.P.
Hastings ...	50 51	0 34 E.	99	●	—	—	00	Rev. H. H. Breton, M.A.
" Cemetery	[illegible]					—	—	Walter Field.

	Hastings Waterworks.	50 51	0 34 E.	270	—	⊙	d.w.(m.)	03	— Farnham, for the Corporation.
	Lewes	*50 52*	*0 1 E.*	*57*	●	—	—	—	C. Brand.
	St. Leonards ...	50 51	0 33 E.	178	II	—	W.m.s.	03	H. Colborne, M.R.C.S., for the Corporation.
	" West Marina.	50 51	0 32 E.	207	III	—	—	03	T. Eldridge, for the Corporation.
	Watergate Park	50 56	0 55 W.	239	●	—	—	99	W. M. Christy.
	Westbourne ...	50 52	0 55 W.	80	—	⊙	(m.)	99	Rev. L. P. Birkett.
	Worthing ...	50 49	0 22 W.	33	III	⊙	d.w.m.	04	Frank Roberts, A.M.I.C.E., for the Corporation.
Wilts :—	Marlborough ...	51 25	1 44 W.	424	III	⊙	w.m.	—	J. C. Alsop.
	Salisbury ...	51 4	1 51 W.	180	II	—	R.	04	Thos. Challis, for the Earl of Pembroke, G.C.V.O.
Channel Islands :—									
	Guernsey, Villa Carey.	49 27	2 32 W.	180	III	⊙	W.m.	04	F. E. Carey, M.D.
	" Brooklyn	49 27	2 31 W.	297	II	⊙ (B θ)	m.R.	04	Adolphus Collenette.
	Jersey, St. Aubin's.	49 12	2 11 W.	25	T	—	D.W.M.R.	04	J. Fisher, for M.O.
	" St. Helier's.	49 11	2 6 W.	—	—	⊙	d.w.(m.)R.	04	Signal Officer, Fort Regent, for M.O.
6. SCOTLAND, WEST, AND ISLE OF MAN.									
Argyleshire :—	Gruline, Isle of Mull.	56 30	6 0 W.	100	●	—	—	—	J. W. Melles.
	Laudale ...	56 41	5 41 W.	14	II	—	W.M.S.	04	J. A. Fletcher, for T. H. G. Newton, M.A.
	§Poltalloch ...	56 8	5 30 W.	132	II	—	s.	05	D. S. Melville, for Lord Malcolm.

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List of Stations arranged according to Districts and Counties—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Self-recording.			
6. SCOTLAND, WEST AND ISLE OF MAN—*cont.*								
Ayr:— No station.								
Bute:— $Rothesay ..	55 50	5 4 W.	115	II	—	s.	05	Robert Henderson.
Dumbarton:— No station.								
Dumfries:— $Dumfries...	55 4	3 36 W.	70	II	—	W.	—	Rev. W. Andson.
Kirkcudbright:— $Cally ...	54 52	4 12 W.	120	II	—	W.M.S.	05	W. Thomson, for H. G. Murray Stewart.
$Cargen ...	55 2	3 37 W.	72	II	—	s.	04	A. Peacock.
Lanark:— Glasgow ...	55 53	4 18 W.	180	I	I	W.M.S.	05	Prof. L. Becker, Ph.D., for the Meteorological Office.
Thornton Hall.	55 46	4 15 W.	440	III	⊙	—	—	John Wilson, for A. Henderson Bishop.
Renfrew:— No station.								
Stirling:— No station.								
Wigton:— No station.								
Isle of Man:— Cronkbourne	54 10	4 29 W.	137	II	⊙ B	W.M.S.	04	A. W. Moore, M.A., J.P., C.V.O.
7. ENGLAND, NORTH WEST, AND NORTH WALES.								
Cheshire:— Bidston ...	53 24	3 4 W.	188	I, T	(I) †	D.W.M.s.R r.	04	W. E. Plummer, M.A., F.R.A.S., for the Mersey Docks and Harbour Board.

	Chester (Hawarden Bridge).	53 12	3 1 W.	22	III	—	W.m.	04	F. B. Summers.
	Chester (Rutland Cottage).	53 12	2 54 W.	59	III	—	—	—	Rev. J. Cairns Mitchell, B.D.
	Hoylake ...	53 23	3 12 W.	30?	III	⊙	w.m.	02	Tom Robinson, for Urban District Council.
Cumberland:—	Aspatria ...	54 46	3 21 W.	250	II	⊙ (🌂)	W.m.R.	04	J. Smith Hill, B.Sc., Agricultural College.
	Carlisle ...	54 53	2 57 W.	111	II	—	R.	04	Studholme Cartmell, for the Corporation.
	Newton Rigg	54 40	2 49 W.	559	II	⊙	W.M.	05	W. T. Laurence, for the Cumberland County Council.
	Uldale (Chapel House Reservoir).	54 43	3 9 W.	599	●	—	—	—	T. Strong, for Aspatria and Silloth Water Board.
Lancashire:—	Blackpool ...	53 48	3 3 W.	66	III	B ⊙ (🌂 ●)	d.W.m.	05	F. J. H. Coutts, M.D., for the Corporation.
	Carnforth (Over Kellet).	54 8	2 44 W.	174	III	⊙	m.	05	W. Farrer.
	Darwen ...	53 41	2 28 W.	710	III	⊙	d.	05	G. Mainland, for the Corporation.
	Fleetwood ...	53 56	3 1 W.	—	—	🌂	—	05	The Urban District Council, for the Meteorological Office.
	Rossall ...	53 55	3 2 W.	—	—	B	—	—	T. G. Benn.
	Manchester (Oldham Road).	53 29	2 13 W.	190	II	⊙	s.R.	04	J. Niven, M.A., M.B., for the Corporation.
	.. (Whitworth Park).	53 28	2 14 W.	125	II	⊙ (B 🌂)	d.M.	04	Prof. Schuster, Sc.D., F.R.S.

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County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Self-recording.			
7. ENGLAND, NORTH WEST, AND NORTH WALES—*cont.*								
Lancashire—*cont.* Manchester (Prestwich).	53° 32′	2° 17′ W.	320	II	⊙	W.m.s.r.	04	T. R. H. Clunn, M.D.
Preston ...	53 46	2 42 W.	148	III	—	r.	04	H. O. Pilkington, M.R.C.S., for the Corporation.
Southport ...	53 39	2 59 W.	37	I	(I) ⊙	d.w.m.	03	J. Baxendell, for the Corporation.
Stonyhurst ...	53 51	2 28 W.	375	I	I	W.M.S.R.	05	Rev. W. Sidgreaves, S.J., for M.O.
Westmorland:— Kirkby Lonsdale.	54 12	2 36 W.	304	●	—	—	—	R. A. Clarke.
Anglesey:— Holyhead (Harbour Office).	53 18	4 39 W.	57	—	◢	—	05	F. M. Cotton, C.E., for M.O.
,, (Sailor's Home).	53 18	4 39 W.	48	T	—	D,W,M.	05	T. Chope, Sailors' Home, for M.O.
Carnarvon:— Llandudno ...	53 21	3 50 W.	71	II	⊖	d.W.m s.R.	04	William Little, for the Town Council.
Penrhyn Quarry.	53 10	4 6 W.	527	●	—	—	01	W. G. Griffith, for E. A. Young.
Denbigh:— Bettws-y-Coed	53 7	3 53 W.	101	II	⊙	d.W.M.	04	Dr. H. W. Fox.
Llanbedr Hall (Ruthin).	53 8	3 17 W.	449	●	—	—	—	George A. Crace-Calvert, M.B.
Flint:— Penbedw ...	53 12	3 11 W.	650	—	B	—	—	H. W. Buddicom.
Rhyl	53 19	3 29 W.	30	III	⊙	d.w.m.	05	A. A. Goodall, for District Council.
Merioneth:— Aberdovey ...	52 33	4 4 W.	—	—	⊙	w.m.	05	W. J. Eves.
Towyn ...	52 35	4 5 W.	10	III	⊙	d.m.	05	E. Lewys Lloyd, M.D.
Montgomery:— No station.								

8. SOUTH WALES AND ENGLAND, SOUTH WEST.									
Brecknock:—	Llangammarch Wells.	52 7	3 32 W.	550	III	⊙	W.m.R.	05	W. Black Jones, M.D., B.S., D.P.H.
Cardigan:—	Aberystwyth...	52 25	4 4 W.	59	III	⊙	d.w.m.	05	A. Thomas, M.D., for the Urban Council.
Carmarthen:—	**Llandovery**	51 59	3 48 W.	248	●	—	—	—	Douglas T. M. Jones.
Glamorgan:—	Cardiff ...	51 28	3 10 W.	50	III	—	W.m.r.	04	E. Walford, M.D., for the Corporation.
	Port Talbot ...	51 34	3 45 W.	179	●	⊙	(m)	03	G. Lipscomb, for Miss Talbot.
Pembroke:—	Haverfordwest.	51 48	4 58 W.	93	(II)	⊙ (B)	(m)	01	J. W. Phillips.
	St. Ann's Head	51 41	5 11 W.	149	T	⊙	D.W.M.R.	05	G. H. Dunsford, Lightkeeper, for M.O
	Tenby... ...	51 41	4 42 W.	79	—	⊙	w.(m)	03	H. L. Truscott, for the Corporation.
Radnor:—	Disserth ...	52 13	3 24 W.	711	●	—	—	00	Rev. J. Le Herbert.
	Rhayader Watershed:	?52 18	?3 29 W.						
	Nantgwillt	—	—	767	●	—	—	—	The Engineer-in-Charge, for the Corporation of Birmingham.
	"	—	—	753	●	—	—	—	
	Abergwngy...	—	—	1,199	●	—	—	—	
	Bwlchyr-hendre.	—	—	1,584	●	—	—	—	
	Claerwen ...	—	—	1,249	●	—	—	—	
	Nant-y-car ...	—	—	1,544	●	—	—	—	
	Pryddellau...	—	—	1,709	●	—	—	—	
	Tremynydd..	—	—	831	●	—	—	—	
Cornwall:—	Falmouth ...	50 9	5 4 W.	167	I	I	W.m.s.R.	05	E. Kitto, for M.O.
	" Pendennis Castle.	50 8	5 3 W.	—	—	◢	—	05	Coastguard, for M.O.

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County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer
				Eye Obs.	Self-recording.			
8. SOUTH WALES AND ENGLAND, SOUTH WEST—*cont.*								
Cornwall—*cont.* Newquay ...	50 25	5 4 W.	250?	III	⊙	w.(m.)	04	C. C. Vigurs, B.A., M.D., for Urban District Council.
Scilly	49 56	6 18 W.	131	T	B ⊙	D.W.M.R.	05	A. Hicks, for M.O.
Devonshire:— Arlington Court	51 8	3 58 W.	613	III	—	W.m.	04	Lady Chichester.
Barnstaple ...	51 5	4 3 W.	24	III	—	R.	04	Thos. Wainwright, for the North Devon Athenæum.
ℳCullompton ...	50 51	3 23 W.	202	III	⊙	W.m.	04	T. Turner, J.P.
Plymouth ...	50 22	4 8 W.	116	II	⊙ (B)	d.W.M.S.R.r.	04	H. Victor Prigg, A.M.I.C.E., for the Corporation.
ℳRousdon ...	50 43	3 0 W.	515	II	(B)	s.	04	C. Grover, for The Hon. Lady Peek.
Salcombe ...	50 14	3 46 W.	300	—	⊙	(m.)	04	W. Barrington Prowse, M.D.
Torquay	50 28	3 31 W.	286	III	⊙	d.w.(m.)	00	F. March, for the Corporation.
ℳWhitchurch ...	50 32	4 6 W.	593	II	—	s.	04	E. E. Glyde.
ℳWoolacombe ...	51 10	4 12 W.	59	II	⊙	S.R.	04	B. Fanshawe.
Monmouth:— Abersychan ...	51 44	3 5 W.	698	●	—	—	—	W. P. James.
Newchurch ...	51 41	2 48 W.	525	●	—	—	—	C. Cullum, for the Corporation.
Newport ...	51 35	3 0 W.	32	III	—	—	04	
Pant-yr-eos ...	51 38	3 4 W	449	●	—	—	00	
Ynys-y-fro ...	51 38	3 3 W.	151	●	—	—	00	
Somerset:— Bath	51 23	2 21 W.	66	T, III	(⊙)	D.W.M.R.	04	W. H. Symons, M.D., for the Corporation.

LIST OF STATIONS ARRANGED ACCORDING TO DISTRICTS AND COUNTIES—*continued.*

County and Station.		Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
					Eye Obs.	Self-recording.			
10. IRELAND, SOUTH.									
		° ′	° ′						
Carlow :—	No station.								
Clare :—	Ennis (Roslevan)	52 51	8 59 W.	38	●	—	—	—	Miss A. L. Scott.
	Ennistymon ...	52 57	9 17 W.	130	●	—	—	—	Rev. O. W. McDowell, M.A.
	Hurdlestown ...	52 48	8 38 W.	157	●	—	—	—	Lt.-Col. W. O. Bentley, R.A.
	Lahinch	52 55	9 21 W.	52	●	—	—	99	Miss I. F. K. Bowen.
	Mount Callan ...	52 53	9 16 W.	479	●	—	—	98	Lt.-Col. Tottenham.
	Newmarket-on-Fergus.	52 46	8 53 W.	85	●	—	—	98	Alfred Barker, for W. W. A. Fitzgerald.
Cork :—	Ballinacurra ...	51 52	8 10 W.	24	III	⊙	w.m.	04	John H. Bennett.
	Donerailе ...	52 13	8 34 W.	266	●	—	—	—	Capt. J. W. Kvans, J.P.
	Roche's Point ...	51 47	8 15 W.	32	T	—	D.W.M.R.F.	05	M. FitzMahoney, Post Office, for M.O.
	Roche's Point	51 47	8 15 W.	—	—	◜	—	—	Captain G. Usborne, for Cork Harbour Commissioners
Dublin :—	Dublin City ...	53 20	6 15 W	47	II	B	W.m.s.R.	03	Sir John W. Moore, M.D., D.Sc.
	„ Phœnix Park.	53 22	6 21 W.	155	II	⊙ ◜	w.M.S.	05	Col. A. D. Mearns, R.E., and Major R. W. H. Buckland, R.E., Ordnance Survey Office.
	„ Botanic Gardens.	53 23	6 16 W.	67	II	—	m.s.	04	F. W. Moore, M.R.I.A.
	„ Trinity College.	53 21	6 16 W.	12	II	⊙	M. (R.)	04	M. S. Moore and T. H. Hill.
	Dundrum ...	53 16	6 14 W.	200	III	—	—	—	Dr. Arthur E. Goff.
	Killiney	53 16	6 7 W.	249	●	—	—	—	R. O'Brien Furlong, C.B.
	Kingstown ...	53 17	6 8 W.	42	III	⊙	m.	03	Dr. J. B. Power, for the Corporation.
	„ Harbour	53 17	6 8 W.	—	—	◜	—	05	Robert Gray, C.E., for H.M. Office of Works.

Kerry:—	Castle Gregory ...	52 15	10 1 W.	34	●	—	—	—	Admiral E. F. Jeffreys, C.V.O.
	Killarney ...	52 4	9 30 W.	174	III	—	W.m.R.	03	E. W. Griffin, M.D.
	Valencia... ...	51 56	10 15 W.	30	I	I, B	D.W.M.s.R.r.	05	J. E. Cullum, for M.O.
	„ Glanleam	51 56	10 20 W.	—	●	—	—	01	A. O'Donoghue.
Kildare:—	Clongowes Wood College.	53 19	6 41 W.	287?	III	(B Θ)	m.	05	Rev. W. P. Hackett, S.J., and A. E. Coulthard, B.Sc.
Kilkenny:—	Kilkenny ...	52 39	7 14 W.	212	III	B	W.m.	02	H. Carlton, for the Marquis of Ormonde, K.P.
King's Co.:—	Birr Castle ...	53 6	7 55 W.	175	II, T	⊙	D.W.M.S.R.r.	05	W. J. Roe and J. H. Skerritt, for the Earl of Rosse, K.P.
Limerick:—	*Corbally*... ...	52 39	8 36 W.	59	●	—	—	02	Poole Gabbett.
	Foynes	52 37	9 7 W.	108	III	—	W.m.	02	J. J. Alcorn, for Lord Monteagle, K.P.
	Roxborough ...	52 35	8 36 W.	107	●	—	—	02	A. W. Shaw.
Queen's Co.:—	No station.								
Tipperary:—	No station.								
Waterford:—	Waterford ...	52 16	7 7 W.	—	—	B	—	02	Harbour Authorities.
	„ ...	52 16	7 7 W.	20?	III	—	W.m.R.	—	J. N. White.
Wexford:—	No station.								
Wicklow:—	Newcastle ...	53 5	6 6 W.	256	II	—	—	02	B. H. Steede, M.A., M.D.

The names of Stations added to the list since April, 1905, are printed in clarendon type; those of Stations now discontinued are printed in italic type.

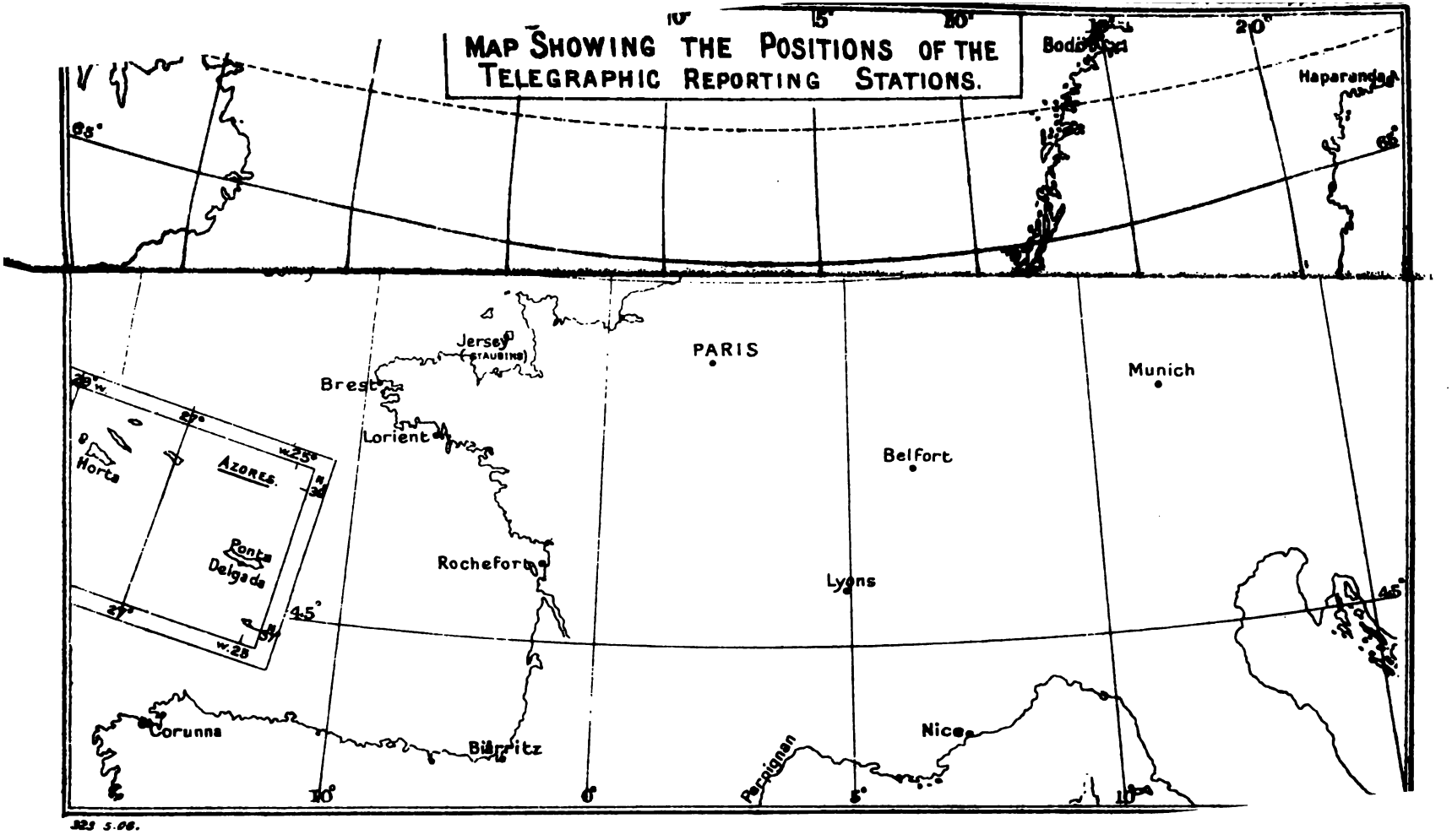
LIST OF FOREIGN STATIONS FROM WHICH REPORTS ARE RECEIVED DAILY BY TELEGRAPH. *See* PAGE 56.

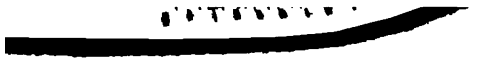
Name of Station.	Authority.
Haparanda	Meteorological Office, Stockholm.
Hernösand	
[2]Stockholm	
Wisby	
Karlstad	
Bodö	Meteorological Institute, Christiania.
[2]Christiansund...	
(1) [2]Skudesnaes	
Færder	
[2]The Scaw	Meteorological Institute, Copenhagen.
Fanö	
Cuxhaven	Deutsche Seewarte, Hamburg.
Berlin	
Frankfurt	
Munich	
[2]The Helder	Bureau Central Météorologique, Paris.
Brussels	
Cape Gris Nez...	
[2]Brest (St. Mathieu)	
Lorient (Ile de Groix) ...	
(1) [2]Rochefort (Ile d'Aix) ...	
[2]Biarritz	
[2]Paris	
Belfort	
Lyons	
Nice	
Perpignan	
Corunna	Observatory, Lisbon.
Lisbon	
[2]Azores (Ponta Delgada) ...	Meteorological Service of the Azores.
„ (Horta)	

Note.—The stations marked (1) report also at 2h. p.m., and those marked (2) at 6h. p.m. Lisbon reports at 4h. p.m. instead of 6h. p.m., and Ponta Delgada at 5h. p.m.
No reports are received from the Helder at 6 p.m. on Sundays.

LIST OF RECIPIENTS OF HARVEST FORECASTS (*see* p. 30) who have kept and returned to the Office a daily record of weather experienced, for the purpose of an independent checking of the forecasts as issued.

M. R. Pryor, Weston Hall, Stevenage, Herts.
T. G. Binney, Guisnes Court, Tolleshunt D'Arcy.
F. Stacey, Wickham Hall, Bishops Stortford.
E. S. Hawkins, Halstead, Essex.
J. Durrant, Westbury, Hitchin, Herts.
G. Wallace Willows, Orton Manor, Kettering.
R. C. Warner, Oaksey, nr. Malmesbury, Wilts.
H. V. Legh, Chyknell, Bridgnorth.
J. Norris, Pagehurst, Staplehurst.
W. Nye, Horsham.
F. R. Allen, Addlestone.
J. S. Kerr, Cholderton, Salisbury.
A. C. Young, Bulford, Wilts.
W. B. Gauntlett, Collingbourne, Kingston, Marlborough, Wilts.
G. Willis, Wroughton, Swindon.
E. L. Clare, Brinscall, Chorley.
G. J. B. Lees, Woodhill, Oswestry.
W. Little, Llandudno.
J. C. Darby, Leap Castle, Roscrea, Ireland.


MAP SHOWING THE POSITIONS OF THE TELEGRAPHIC REPORTING STATIONS.
10°
15°
20°
Bodö
Haparanda
65°
PARIS
Munich
Jersey
(STAUBING)
Brest
Lorient
Belfort
Horta
AZORES.
W.25°
N.
38°
Ponta Delgada
37°
W.28
Rochefort
Lyons
45°
Corunna
Biarritz
Perpignan
Nice
10°
5°
0°
5°
10°
323 5.06.



List of Sea Temperature Stations.

'deen, Cove Bay.
n, North, Galway.
ma Bank Lightship.
ntrae, Ayrshire.
'donegan, Co. Cork.
'glass, Co. Mayo.
ls Rock Lightship.
ksod Point, Co. Mayo.
kwater Bank Light-
.
mouth, Ayton, Berwick.
tisland.
narvon Bay Lightship.
igan Bay Lightship.
gan, Co. Galway.
ngbeg Lightship.
arty.
ts Rock Lightship.
bourne.
Goodwin Lightship.
ish and Welsh Grounds
htship.
net Rock Lighthouse.
'head Harbour Office.
'edane, Co. Clare.
stown, Sandy Cove.
wall.
Bank Lightship.
ash, Isle of Arran.
n and Ower Lightship.
ick.

*Liscannor, Co. Clare.
†Morecambe Bay Lightship.
†Newarp Lightship.
*Newquay, Cornwall.
†North Arklow Lightship.
†North-West Lightship.
†Outer Dowsing Lightship.
†Owers Lightship.
*Pennan Bay, Aberdour.
*Port Erin.
*Portrush.
†Royal Sovereign Lightship.
†St. Ann's Head, Pembroke.
*Salcombe, Devon.
*Scarborough.
[4] Scilly Islands, St. Mary's.
*Seafield, Co. Clare.
†Seven Stones Lightship.
†Shambles Lightship.
*Sheephaven, Dunfanaghy.
†Shipwash Lightship.
†Skulmartin Lightship.
†Solway Lightship.
†South Arklow Lightship.
†South Rock Lightship.
†Spurn Lightship.
*Stornoway.
*Sunderland.
*Teelin, Co. Donegal.
*Uzon, Montrose.
*Wick.

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names of Stations added to the list since last Report are printed in
don type.
observers are indicated thus :—* Coastguard, † Lightkeepers, [1] S. R.
son, [2] F. M. Cotton, C.E., [3] A. Carson, [4] A. Hicks.

LIST OF STATIONS in the COLONIES and DEPENDENCIES and in FOREIGN COUNTRIES from which RETURNS are received in MANUSCRIPT.

NOTE.—Returns received in printed form are included in Appendix VII.

Station.	Latitude.	Longitude.	Height in Feet above M.S.L.	Order of Station. (See p. .)	Year of Commencement of Observations.	Observer.
MEDITERRANEAN.	° ′	° ′				
Cyprus, ‡Famagusta	35 7 N.	33 57 E.	34	II	1881	L. Bérand, for Dr. Heidenstam, C.M.O.
,, ‡Kyrenia	35 21 N.	33 19 E.	54	II	1881	P. Michaelide ,, ,, ,,
,, ‡Larnaca...	34 55 N.	33 37 E.	19	II	1881	P. Nicopoulos ,, ,, ,,
,, ‡Limassol	34 40 N.	33 1 E.	26	II	1881	M. Theodorides and J. Josif, for Dr. Heidenstam, C.M.O.
,, ‡Nicosia...	35 11 N.	33 22 E.	493	II	1881	J. Samaras and T. G. Farhat, for Dr. Heidenstam, C.M.O.
,, ‡Papho	34 46 N.	32 25 E.	202	II	1881	Y. V. Zachariades, for Dr. Heidenstam, C.M.O.
Gibraltar	30 6 N.	5 21 W.	48	II	1883	Sergt. M. Davis, for Col. J. McNamara, M.D., C.M.O.
Morocco. ‡Cape Spartel	35 47 N.	5 55 W.	191	II	1893	Edwin C. Hathaway, for Lloyds.
,, Casablanca	†33 37 N.	7 34 W.	4	●	1896	G. H. Lerman.
,, Mogador	31 30 N.	9 42 W.	19	●	1903	A. M. Madden, H.B.M. Vice-Consul.
,, Saffi	†32 17 N.	9 8 W.	40	●	1905	John Aussi.
Syria, Beyrout	33 54 N.	35 28 E.	172	II	1883	Robt. H. West, M.A.
AFRICA.						
East :—						
Upper Sheikh	9 56 N.	45 11 E.	4,595	III	1903	Dr. R. E. Drake Brockman.
Central :—						
Eastern Soudan, Wadelai ...	†2 40 N.	31 35 E.	2,200	III	1901	F. N. Dias.
Uganda, Butiaba	—	—	—	●	1904	R. K. Mitter.
,, Bugala, Serre Island	—	—	—	●	1904	Rev. H. T. C. Weatherhead.
,, Entebbe	0 4 S.	32 30 E.	3,906	III	1896	T. Remedios and E. Brown.
,, Fort Portal	†0 40 N.	30 20 E.	5,299	III	1901	E. Coutinho.
,, Gondokoro	†4 54 N.	31 44 E.	1,500	III	1901	J. R. M. Silva.

„ Jinja	0	24 N	33	13 E.	3,650	III	1901	W. A. Densham and S. M. Inudalia.
„ Lumbuyu Hill ...		—		—	—	●	1896	A. Watson.
„ Masaka	†0	20 S.	31	50 E.	—	III	1902	C. G. Disled.
„ Mbarara	†0	39 S.	30	49 E.	4,500	III	1901	J. J. de Sousa.
„ Nimule	3	38 N.	32	11 E.	2,083	III	1903	A. S. Pinto and E. Gracias.
West Central :—								
Upper Congo, Yakusu ...	0	34 N.	25	1 E.	—	III	1905	S. Osborne Kempton.
West :—								
Gold Coast, Aburi		—		—	—	III	1893	E. C. Andrews, for Director of Agriculture.
„ Accra	†5	35 N.	0	6 W.	—	III	1893	Dr. R. H. Kennan and Dr. C. H. D. Ralph.
„ Axim	†4	50 N.	2	12 W.	—	III	1895	Dr. A. Macqueen and Dr. A. E. Horn.
„ ‡Cape Coast Castle	†5	15 N.	0	30 W.	—	III	1895	Dr. W. W. Claridge and Dr. H. T. Cookman.
„ Gambaga	†10	31 N.	0	26 W.	—	III	1899	Dr. G. L. Barker and Dr. C. V. Le Fanu.
„ Kumasi	†6	50 N.	2	16 W.	—	III	1899	Dr. G. J. Rutherford.
„ Kwitta	†5	59 N.	0	59 E.	—	III	1895	Dr. F. S. Harper and Dr D. Cowin.
„ Sekondi	5	0 N.	1	40 W.	—	III	1904	Dr. E. L. Hunt. C.M.G., and F. Mayer.
Sierra Leone	8	30 N.	13	9 W.	179	II	1895	Dr. H. S. Taylor, Capt. R.A.M.C., and Dr. H. Hurrick, Capt. R.A.M.C.
WEST INDIES.								
Bahamas, ‡*Abaco	25	52 N.	77	11 W.	70	II	1859	J. W. Roberts.
„ ‡*Cay Lobos	22	33 N.	77	36 W.	15	II	1877	C. S. E. Lotmore and S. W. Roberts.
„ ‡*Cay Sal	23	42 N.	80	25 W.	30	II	1859	Lightkeepers.
„ ‡*Inagua	21	21 N.	73	1 W.	21	II	1871	J. A. Williams.
„ Nassau	†25	2 N.	77	25 W.	—	III	1895	P. H. Burns, Supt. Bahamas Cable.
„ ‡*Watling's Island ...	23	57 N.	74	28 W.	60	II	1889	T. R. Thompson, senr.
Barbados	†13	12 N.	59	35 W.	181	II	1895	John R. Bovill.
‡*Sombrero	18	36 N.	63	28 W.	30	II	1867	J. A. Richardson and A. L. Richardson.

* Lighthouse ; contributes register containing observations every 4 hours.
† The positions and heights of the stations are those given by the observers, except in cases marked †, for which the information given has been obtained from other sources.
‡ The Meteorological instruments in use at this Station are lent by the Meteorological Committee.

LIST OF STATIONS in the COLONIES, &c., from which RETURNS are received in MANUSCRIPT—*continued.*

Station.	Latitude.	Longitude.	Height in Feet above M.S.L.	Order of Station. (*See* p. .)	Year of Commencement of Observations.	Observer.
AMERICA.						
Central :—	° ′	° ′				
‡Panama, Colon	†9 23 N.	79 23 W.	—	II	1897	The Ven. Archdeacon S. P. Hendrick.
South :—						
British Guiana, Georgetown...	6 49 N.	56 10 W.	0	⊙	1887	E. S. Christiani.
ATLANTIC.						
South :—						
Falkland Islands :—						
*Cape Pembroke	51 41 S.	57 42 W.	70	II ⊙	1859	J. Pearce.
‡Stanley	—	—	—	⊙	—	His Excellency W. L. Allardyne.
‡St. Helena, St. Matthew's Vicarage.	16 0 S.	5 40 W.	1,887	II	1885	A. L. C. Hands.
„ Central, Oak Bank	—	—	1,696	●	1902	J. Homagee.
„ St. Paul's Vicarage	—	—	1,694	●	1905	Alfred Porter.
INDIAN AND PACIFIC OCEANS, &c.						
China :—						
Chinkiang	32 10 N.	119 40 E.	36	II ⊙	1905	Capt. Louis H. Tamplin.
Mauritius, Royal Alfred Observatory.	20 6 S.	57 31 E.	181	(I)	1901	T. F. Claxton.
‡Ocean Island	0 52 S.	169 35 E.	100	II B.	1905	J. G. Talbot and J. H. Langley, for the Pacific Phosphate Company.

* Lighthouse ; contributes register containing observations every 4 hours.

† The positions and heights of the stations are those given by the observers, except in cases marked †, for which the information given has been obtained from other sources.

‡ The Meteorological instruments in use at this Station are lent by the Meteorological Committee.

I.—List of Publications Issued under the Authority of the Meteorological Committee of the Royal Society (1867 to 1876), the Meteorological Council (1877 to 1905), or the Meteorological Committee appointed by Treasury Minute, May 20th, 1905.*

The list is arranged under the following headings :—

1. Periodical Publications.†
2. Occasional Publications and Reports.
3. Instructions in the use of Instruments, &c.
4. Marine Meteorology.
5. Miscellaneous Publications.

1. Periodical Publications.

Daily Weather Reports. Subscription, 5*s.* per quarter.

Weekly Weather Reports. With Appendices and Monthly Supplements priced separately :—

‡1888. Vol. V. (Official, No. 85.) 4*d.* per week. Annual Volume, including Supplements and Appendices, 21*s.* 2*d.*

1889-1906. Vols. VI.–XXIII. 6*d.* per week. Annual subscription, including Supplements and Appendices, 30*s.*

Monthly Meteorological Charts of the North Atlantic and Mediterranean and of the Indian Ocean. *See* Marine Meteorology.

Monthly Weather Reports :—

§1884–1887. In Monthly Parts, 1*s.* 6*d.* to 2*s.* 6*d.* each, except May to December, 1887, which is in wrapper, price 12*s.*

Quarterly Weather Reports :—

1869–1880. At prices varying from 4*s.* to 10*s.* each Quarterly Part. 1877–1880 :—Appendices and Plates are published for these years at 27*s.* or 28*s.* per yearly set.

Annual Volumes :—

Reports of the *Meteorological Committee* of the Royal Society :—

1867–1877. At prices varying from 4*d.* to 1*s.* per Report, except 1876–1877, 3*s.* 5*d.*

Reports of the *Meteorological Council* :—

1878–1905. At prices varying from 5*d.* to 1*s.* 2*d.*, except 1884–5, 4*s.*

Report of the *Meteorological Committee* :—

1905–06. Price .

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* These publications are sold by Messrs. Wyman and Sons and other agents for the sale of the publications of H.M. Stationery Office; Annual Reports by Parliamentary Booksellers; Pilot Charts and Charts published by the Admiralty, by Messrs. J. D. Potter & Co.

† These have from time to time contained Tables of Mean Values and papers on various Meteorological Investigations. A List of the more important of these contributions to Meteorological knowledge will be found in Appendix XI. of the Report for 1903–04.

‡ The publication of the Weekly Weather Report began in February 1878. Annual subscription, including Supplements and Appendices, post paid, 1878–1883, 12*s.* 6*d.*; 1884–1887, 21*s.* 2*d.*

§ The publication of the Monthly Weather Report was continued after 1887 as a Supplement to the Weekly Weather Report.

1. Periodical Publications—*continued.*

Observatories and Stations.

*Hourly Readings from the Self-Recording Instruments at the . . . Observatories under the Meteorological Council :—

1881–1886. In Parts, varying in price from 10*s.* to 30*s.* each.

1900 to 1903. 25*s.* each, or 6*d.* per month each station. 1904 in the Press.

Hourly Means of the Readings obtained from the Self-Recording Instruments at the . . . Observatories under the Meteorological Council :—

1887–1899. In Annual Volumes, at prices varying from 15*s.* to 38*s.*

Meteorological Observations at Stations of the Second Order :—

†1876–1901. At prices varying from 20*s.* to 35*s.*

2. Occasional Publications and Reports.

ATLAS :—

Meteorological Atlas of the British Isles. (Official, No. 53. 1883.) 5*s.* 6*d.*

CONGRESSES, CONFERENCES, &c., Reports of Proceedings :—

Leipzig. 1872. (Non-Official, No. 6.) 1*s.*
Vienna. 1873. (Official, No. 21.) 1*s.*
Vienna and Utrecht. 1873 and 1874. (Non-Official, No. 9.) 1*s.* 6*d.*
London. 1874. Maritime Meteorology. (Official, No. 23.) 2*s.*
London. 1876. With Supplement. (Non-Official, No. 11.) 2*s.*
Utrecht. 1878. (Non-Official, No. 13.) 6*d.*
Rome. 1879. (Official, No. 36.) 1*s.* 6*d.*
Berne. 1880. (Non-Official, No. 14.) 1*s.*
Copenhagen. 1882. (Non-Official, No. 15.) 2*s.* 6*d.*
Paris. 1885. (Non-Official, No. 16.) 1*s.*
Zürich. 1888. (Non-Official, No. 17.) 4*d.*
Munich. 1891. (Official, No. 102.) 1*s.* 6*d.*
Upsala. 1894. (Official, No. 115.) 1*s.*
Paris. 1896. (Official, No. 127.) 1*s.*
St. Petersburg. 1899. (Official, No. 148.) 2*s.*
Southport. 1903. (Official, No. 164.) 2*s.*

Report on Weather Telegraphy and Storm Warnings. 1873. (Non-Official, No. 8.) 6*d.*

Reports . . . on Atmospheric Electricity, Maritime Meteorology and Weather Telegraphy. 1878. (Non-Official, No. 12.) 2*s.*

FOG :—

London Fog Inquiry, 1901–03. (Official, No. 160. 1904) :—
Report of the Council, with Report by R. G. K. Lempfert, M.A. (1904). 2*s.* 6*d.*
Report by Captain Alfred Carpenter, R.N., D.S.O. (1903). 2*s.*

FOREIGN AND COLONIAL STATIONS :—

Contribution to the Meteorology of Japan.—By Staff-Com. Thomas H. Tizard, H.M.S. "Challenger." (Official, No. 28. 1876.) [Out of Print.]

Report on the Meteorology of Kerguelen Island.—By Rev. S. J. Perry, S. J., F.R.S. (Official, No. 37. 1879.) 3*s.*

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* For the years 1874–1880 the Hourly Readings were issued in lithographed form. Price 20*s.* per annum.

† The Observations at Stations of the Second Order for 1873–75 will be found in the Quarterly Weather Report for the respective years.

2. Occasional Publications and Reports—*continued.*

FOREIGN AND COLONIAL STATIONS—*continued.*

Meteorological Observations at the Foreign and Colonial Stations of the Royal Engineers, and the Army Medical Department, 1852 – 1886. (Official, No. 83. 1890.) 23*s.*

Meteorological Observations made at Sanchez, Samaná Bay, St. Domingo, 1886–1888.—By the late W. Reid, M.D. (Official, No. 89. 1890.) 8*s.* 6*d.*

Climatological Observations at Colonial and Foreign Stations:—

I.:—Tropical Africa, 1900–1902, with Summaries and Map.—By E. G. Ravenstein, F.R.G.S. (Official, No. 165. 1904.) 6*s.*

RAINFALL:—

Rainfall Tables of the British Isles for 1866–80. Compiled by G. J. Symons, F.R.S. (Official, No. 47. 1883.) 7*s.* 6*d.*

Rainfall Tables of the British Islands, 1866–90. (Official, No. 114. 1897.) 6*s.*

Diurnal Range of Rain at the Seven Observatories in connection with the Meteorological Office, 1871–1890. (Official, No. 143. 1900.) 2*s.* 6*d.*

SUNSHINE:—

Sunshine Records of the United Kingdom for 1881. (Official, No. 56. 1883.) 4*s.*

Ten Years' Sunshine in the British Isles, 1881–90. (Official, No. 98. 1891.) 2*s.*

TEMPERATURE:—

Temperature Tables for the British Islands. 10*s.* 6*d.* Supplement:—Difference Tables for each Five Years for the Extrapolation of Mean Values. (Official, No. 154. 1902.) 3*s.*

WIND.

The Beaufort Scale of Wind-force. Report of the Director of the Meteorological Office upon an Inquiry, with a Paper by G. C. Simpson, M.Sc., and Notes by Sir G. H. Darwin, K.C.B., F.R.S., W. H. Dines, F.R.S., and Commander Campbell Hepworth, C.B., R.N.R., Marine Superintendent. (Official, No. 180. 1906.) 1*s.* 6*d.*

3. Instructions in the use of Instruments, &c.

Barometer Manual for the Use of Seamen. With an Appendix on the Thermometer, Hygrometer, and Hydrometer. Fifth Edition, extensively Revised. 1905. (Official, No. 61.) 3*d.*

Fishery Barometer Manual. New Edition. 1887. (Official, No. 3.) 6*d.*

Instructions for Meteorological Telegraphy. New Edition. (Official, No. 2.) Prepared for the use of Observers exclusively.

Instructions in the use of Meteorological Instruments. Reprinted 1892. (Official, No. 24.) [Out of Print.]

Hints to Meteorological Observers in Tropical Africa, with Instructions for taking Observations, and Notes on Methods of recording Lake Levels. (Official, No. 162. 1902.) 9*d.*

FORECASTING:—

Aids to the Study and Forecast of Weather.—By W. Clement Ley, M.A. (Official, No. 40. 1880.) 1*s.*

Principles of Forecasting by means of Weather Charts.—By the Hon. Ralph Abercromby, F.R.Met.Soc. Second Edition, Revised, 1885. (Official, No. 60.) [Out of Print.]

4. Marine Meteorology.

CHARTS :—

Arabian Sea :—

Daily Weather Charts for the period of six weeks ending June 25, 1885, to illustrate the tracks of two cyclones in the Arabian Sea. (Official, No. 80. 1891.) 10*s.*

Atlantic :—

Charts of Meteorological Data for the Nine 10° Squares of the Atlantic, which lie between 20° N. and 10° S., and extend from 10° to 40° W., with accompanying Remarks, ending with the Best Routes across the Equator. (Official, No. 27. 1876.) 24*s.*

Monthly Current Charts for the Atlantic Ocean. From information collated and prepared in the Meteorological Office. Published by the Admiralty. (Official, No. 132. 1897.) 7*s.*

Atlantic (North) :—

Charts of Meteorological Data for Square 3, Lat. 0°–10° N., Long. 20°–30° W., and Remarks to accompany the Monthly Charts, which show the Best Routes across the Equator for each Month, &c. (Official, No. 20. 1874.) 20*s.*

Charts illustrating the Weather of the North Atlantic Ocean in the Winter of 1898–99 (Official, No. 142. 1901.) 6*s.* 6*d.*

Currents and Surface Temperature of the North Atlantic Ocean, from the Equator to Latitude 40° N., for each Month of the Year. With a General Current Chart. (Official, No. 12. 1872.) 2*s.* 6*d.*

Discussion of the Meteorology of that Part of the Atlantic lying North of 30° N., for the eleven days ending 8th February, 1870. With Charts. (Official, No. 13. 1872.) 5*s.*

Meteorology of the North Atlantic during August, 1873, with 31 Synoptic Charts. (Official, No. 32. 1878.) With book of Charts, 15*s.*

Synchronous Weather Charts of the North Atlantic and the Adjacent Continents, 1st August, 1882, to 3rd September, 1883. Parts I. to IV. (33 sheets each). (Official, No. 71. 1886.) 17*s.* each Part.

Monthly Pilot Charts, commencing April, 1901. (Official, No. 149.) 6*d.* each. Subscription for one year, 5*s.* (exclusive of postage).

Atlantic (South) :—

Charts showing the Surface Temperature of the South Atlantic Ocean in each month of the Year. (Official, No. 4. 1869.) 2*s.* 6*d.*

Wind Charts for the Coastal Regions of South America, from information collated and prepared in the Meteorological Office. Published by the Admiralty. (Official, No. 159. 1902.) 7*s.*

Monthly Wind Charts of the South Atlantic. Published by the Admiralty. (Official No. 168. 1903.) 6*d.* each.

The relation between Pressure, Temperature, and Air Circulation over the South Atlantic Ocean. (Official, No. 177. 1905.) 9*d.*

Atlantic, Indian, and Pacific Oceans :—

Charts showing the Surface Temperature of the Atlantic, Indian, and Pacific Oceans. (Official, No. 59. Second Edition, 1903.) 4*s.* 6*d.*

Charts showing the Mean Barometric Pressure over the Atlantic, Indian, and Pacific Oceans. (Official, No. 76. 1887.) 10*s.* 6*d.* Supplementary Chart, 6*d.*

4. Marine Meteorology—*continued.*

CHARTS—*continued.*

Indian Ocean :—

Monthly Current Charts for the Indian Ocean, from information collated and prepared in the Meteorological Office. Published by the Admiralty. (Official, No. 124. 1896.) 7*s.*

Monthly Meteorological Charts of the Indian Ocean. (Official, No. 181.)

Meteorological Charts of the portion of the Indian Ocean adjacent to Cape Guardafui and Ras-Hafún. (Official, No. 92. 1891.) 6*s.*

Indian Ocean (South) :—

Meteorological Charts for the Ocean District adjacent to the Cape of Good Hope, with accompanying Remarks. (Official, No. 43. 1882.) Charts, 25*s.*; Remarks, 7*s.*

Cyclone Tracks in the South Indian Ocean, from information compiled by Dr. Meldrum, C.M.G., F.R.S. (Official, No. 90. 1891.) [Out of print.]

Pacific Ocean :—

Quarterly Current Charts for the Pacific Ocean, from information collated and prepared in the Meteorological Office. Published by the Admiralty. (Official, No. 134. 1897.) 5*s.*

Red Sea :—

Meteorological Charts of the Red Sea. (Official, No. 106. 1895.) 21*s.*

Southern Ocean :—

Meteorological Charts of the Southern Ocean between the Cape of Good Hope and New Zealand. (Official, No. 123. 1899.) [Out of print. New Edition in preparation.]

OTHER PUBLICATIONS ON MARINE METEOROLOGY :—

Report to the Committee of the Meteorological Office on the Meteorology of the North Atlantic.—By Capt. H. Toynbee, F.R.A.S. (Non-Official, No. 2. 1869.) 1*s.*

Contributions to our Knowledge of the Meteorology of Cape Horn and the West Coast of South America. (Official, No. 11. 1871.) 2*s.* 6*d.*

Routes for Steamers from Aden to the Straits of Sunda and back Translated from a Paper issued by the R. Meteor. Inst. of the Netherlands. (Non-Official, No. 4. 1872.) [Out of print.]

On the Winds, &c. of the North Atlantic along the Tracks of Steamers from the Channel to New York. Translated from a Paper issued by the Deutsche Seewarte, Hamburg. (Non-Official, No. 5. 1872.) 6*d.*

Notes on the Form of Cyclones in the Southern Indian Ocean.—By C. Meldrum, M.A., F.R.S. (Non-Official, No. 7. 1873.) [Out of print.]

Contributions to our Knowledge of the Meteorology of the Antarctic Regions. (Official, No. 18. 1873.) 2*s.*

On the Physical Geography of the part of the Atlantic which lies between 20° N. and 10° S. and extends from 10° to 40° W. A Paper read before the British Association at Bristol, in August, 1875.—By Capt. H. Toynbee, F.R.A.S. (Non-Official, No. 10. 1876.) [Out of print.]

Contributions to our Knowledge of the Meteorology of the Arctic Regions. (Official, No. 34. 1885.) Vol. 1.: Part I., 2*s.*; II., 10*s.*; III., 6*s.*; IV., 5*s.*; V., 6*s.*

Report on the Gales experienced in the Ocean District adjacent to the Cape of Good Hope between Lat. 30° and 50° S., and Long. 10° and 40° E.—By Capt. H. Toynbee, F.R.A.S. (Official, No. 44. 1882.) 7*s.* 6*d.*

5. Miscellaneous Publications.

Report of an Inquiry into the Connexion between Strong Winds and Barometrical Differences.—By Robert H. Scott. (Non-Official, No. 1. 1868.) 6*d*.

Report to the Committee of the Meteorological Office on the use of Isobaric Curves.—By Capt. H. Toynbee, F.R.A.S. (Non-Official, No. 3. 1869.) [Out of print.]

Report on the Storm of October 13–14, 1881.—By Robert H. Scott, F.R.S. (Official, No. 46. 1882.) 1*s*. 6*d*. [Out of print.]

Harmonic Analysis of Hourly Observations of Air Temperature and of Pressure at British Observatories. (Official, No. 93. 1891.) 1*s*.

Life History of Surface Air Currents. A Study of the Surface Trajectories of Moving Air.—By W. N. Shaw, Sc.D., F.R.S. (Director of the Meteorological Office), and R. G. K. Lempfert, M.A. (Official, No. 174. 1906). 7*s* 6*d*.

APPENDIX III.

LIST of CAPTAINS who have sent in Logs classed as "Excellent" during the year ending March 31, 1906. Figures are attached to the name of each observer to show the number of "Excellent" logs which he has supplied during the whole time of his co-operation with the Office.

Name of Captain.	Number of "Excellent" Logs.	Ship.
Andersen, C. B.	2	S.S. Italian Prince.
Bayldon, F. J., Sub-Lieut., R.N.R.	2	S.S. Induna.
Bennett, C. D., Commr., R.N.R.	3	S.S. Macedonia.
Castle, E. W.	1	S.S. Miami.
Eagleton, H. A., Lieut., R.N.R.	2	S.S. Napolitan Prince.
Ellis, A. E.	1	S.S. Alabama.
Falla, J. F.	1	S.S. Gladiator.
Heron, A.	1	S.S. Alva.
MacIntosh, C. F.	1	S.S. Clan Ranald.
Mayoss, F., Lieut., R.N.R. ...	1	S.S. Ruapehu.
McKellar, A. W.	1	S.S. Tongariro.
Millican, J. W.	26	S.S. Greta Holme.
Monro, Commr. C. E., R.N. ...	1	H.M.S. Rambler.
Mullan, F. C., F.R.G.S. ...	18	S.S. Ramsay.
Neale, H. H.	1	S.S. Manistee.
Reside, D.	1	S.S. Miami.
Robertson, J., Sub-Lieut., R.N.R.	1	S.S. Goorkha.
Robinson, J. C....	7	S.S. Armadale Castle.
Scudamore, J. H. H., Sub-Lieut., R.N.R.	1	S.S. Manistee.
Simpson, A.	41	S.S. Moravian.
Squares De Carteret, W. G. ...	23	S.S. Minia.
Sumner, H. N.	1	S.S. Clan Colquhoun.
Tait, T. A.	1	S.S. Wellington.
Webster, G. S., Lieut., R.N.R.	5	S.S. Lake Michigan.
Weston, T. S.	1	S.S. Papanui.
White-Parsons, V.	1	S.S. Wakanui.

APPENDIX IV.

METEOROLOGICAL REGISTERS received during the Year 1905–06.

(1.)—*From the* ROYAL NAVY.—*Meteorological Logs* (13).

H.M.S. Ship.	Commanding Officer.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
				Mths. Days.	
"Egeria"	J. F. Parry (Captain) ...	Lieutenant J. H. Nankivell	1	8 0	Off Vancouver Island. *Surveying.*
"Goldfinch" ...	F. C. Learmonth (Captain).	Assistant Paymaster R. Sydney Smith; Lieutenant F. A. Reyne; and Sub-Lieutenant C. H. Jones.	2*	7 29	Between Gibraltar and Sierra Leone. *Surveying.*
	F. H. Walter (Commander).	Sub-Lieutenant C. H. Jones	1	4 1	" " "
"Implacable"	Colin Keppel, C.B., D.S.O. (Captain).	Commander C. W. C. Strickland, assisted by the Midshipmen.	1*	4 4	In the Mediterranean.
	G. E. Patey, M.V.O. (Captain).		2*	8 8	In the Mediterranean and Straits.
"Penguin"	C. H. Simpson (Captain)	Sub-Lieutenant C. R. Dare	1	4 0	Off Coast of Queensland. *Surveying.*
"Rambler"	C. E. Monro (Commander).	Lieutenant Kenelm E. L. Crighton, and Petty Officers J. Gallagher; O. Smith; — Yates; — Howland; and — Ellinor.	2	8 4	Off Coast of Borneo. *Surveying.*
"Waterwitch"	E. C. Hardy (Captain) ...	Lieutenant P. R. Stevens	1	2 17	Off Coast of China near Hong Kong. *Surveying.*
	R. W. Glennie (Captain)		2	9 0	

(2.)—SPECIAL SERVICE.—*Uncommissioned Ships* (4).

"Conway," School Ship.	H. W. Broadbent, Lieut., R.N.R.	The Cadets...	1	1 25	At Birkenhead.
"Maine," Hospital Ship.	F. J. Languedoc ...	H. A. Lloyd; S. S. Allen; W. R. Tilling.	1	3 25	In the Mediterranean and to Portsmouth.

METEOROLOGICAL REGISTERS received during the Year 1905-06—*continued.*

(3.)—*From the* MERCANTILE MARINE.—*Meteorological Logs*—continued.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
				Mths. Days.	
"Armadale Castle," S.S.	J. C. Robinson	D. E. Easton; D. Hoskins; B. Parkinson; J. Robertson.	2	7 3	To Cape Town.
"Assyria," S.S. ...	F. Blight	A. H. Brown; T. Richmond; D. Munro	2	4 8	To Calcutta.
"Asuncion de Larranaga," S.S.	H. C. Kramer	J. Duncan; H. Neligan; R. A. Ferns	2	6 10	From Buenos Ayres to Iquique and home. To Galveston.
"Athenic," R.M.S. ..	C. H. Kempson, Lieut. R.N.R.	G. A. Alcock, Lieut., R.N.R.; V. W. Hickson, Lieut., R.N.R.; H. J. Learmouth; W. B. Starr; J. A. Alcock; J. L. Jones.	2	5 24	To New Zealand.
"Atrato," R.M.S. ...	R. H. Stranger	E. Clarke; W. Kennett; J. Coppin; J. Day; G. S. Walker; E. Balding; T. R. Miles; J. Watts; H. M. Williams.	2	6 39	To West Indies and Central America.
"Austriana," S.S. ...	H. F. Harrison	—. Michelson; —. Stead; —. Bailey	1	2 4	To Buenos Ayres and Bahia Blanca.
"Barton," S.S. ...	B. Maughan	G. Worley; W. H. Richardson; H. J. Dickinson; I. J. Lewis; H. S. Darkins.	4	7 24	To Rangoon *vid* Cape of Good Hope returning *vid* Suez. To Black Sea. To Newport News.
"Bellarden," S.S. ...	P. Maclachlan	L. Petterson; H. J. Sinclair... ...	1	2 0	To Monte Video.
"Ben Nevis," S.S. ...	P. W. S. Pritchard ...	N. Gray; A. S. Mackay; E. Walters	1	5 7	To Calcutta.
"Bombay," S.S. ...	H. A. Vicary	J. Bain; H. McMullan; R. Collins...	1	5 8	To Bombay. From Calcutta to Saigon, Madagascar returning to Calcutta and home.

"Brooklyn City," S.S.	J. J. Bailey, Sub-Lieut. R.N.R.	A. E. Athersuch; H. Davidson ...	2	6	20	To New York.
"Cairndon," S.S. ...	Chris. Hawick	... ...	1	1	16	To Savannah.
"Caledonia," S.S. ...	W. Mallett	A. Jensen	2	4	29	To Kurrachee. To Monte Video.
"Campania," S.S. ...	J. Pritchard	E. A. Woodward; G. S. Horsburgh; C. D. Cay.	1	3	3	To New York.
"Carisbrook Castle," R.M.S.	R. F. Harries	F. Tunbridge; H. E. Weller; E. A. Comley.	1	2	12	To Cape Town.
"Cayo Soto," S.S. ...	E. C. Redder	G. H. Ellis; R. Newlands; T. Beer...	1	1	23	From Newport News to West Indies and back, thence to London.
"Cevic," S.S.... ...	W. H. Clarke	E. Jones; F. Brown; G. Shaw; M. Owen; J. Fayster; H. W. A. Staley.	1	3	27	To New York.
"Chickahominy," S.S.	H. Halpin	H. Phillips; E. P. Green; A. D. R. Risely; Geo. Taylor.	2	2	16	To West Indies.
	J. H. H. Soudamore, Sub-Lieut. R.N.R.			3	6	
"China," R.M.S. (P. & O.).	G. K. Wright, Com. R.N.R.	A. V. Worthington; J. McGregor; J. Plumpton; V. C. Bowles; A. Maskell; C. H. Druce; R. G. Pearce; C. J. H. Good.	3	6	16	To Sydney (2). To Bombay (1).
	S. de B. Lockyer, Commr. R.N.R.	R. C. Warden, Sub-Lieut. R.N.R.; A. Maskell; J. McGregor; J. Plumpton; R. H. Gill.	1	2	20	To Sydney.
"Clan Chattan," S.S.	A. Weir	A. Scotland; R. Swan; F. Hawley...	1	2	7	To Bombay.
"Clan Colquhoun," S.S.	H. N. Sumner	G. Scott; A. Thomson; W. Smith; C. L. Matthews.	1	2	11	To Calcutta.
"Clan Cumming," S.S.	F. W. T. Barber ...	W. L. Anderson; T. Brocklebank; D. Muirhead.	2	5	23	To Delagoa Bay *viâ* Cape of Good Hope, returning *viâ* Suez. To Chittagong.
"Clan MacIntyre," S.S.	H. G. Fishenden, Lieut. R.N.R.	R. Pell; J. Mackenzie; F. S. Piper; E. Davies; J. B. Gourlay.	2	6	3	To India *viâ* Cape of Good Hope, returning *viâ* Suez.
"Clan MacKinnon," S.S.	C. Jones	J. E. McLean; W. F. West; G. L. Kemp; C. T. C. Barker.	2	4	8	To India.
	D. S. Smith			2	7	
"Clan MacNab," S.S.	E. H. Howell, Lieut. R.N.R.	A. B. Lyall; A. D. Turton; E. R. C. Nanson.	2	5	7	To Natal and India.

METEOROLOGICAL REGISTERS received during the Year 1905–06—*continued.*

(3.)—*From the* MERCANTILE MARINE.—*Meteorological Logs*—continued.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
				Mths. Days.	
"Clan MacNeil," S.S.	Samuel Beer	L. G. Openshaw; R. M. Robertson; A. McKinlay; D. McBain.	1	3 3	To India *viâ* Cape of Good Hope, returning *viâ* Suez.
"Clan Monroe," S.S.	T. A. Brown, Lieut. R.N.R.	A. M. Haldane; T. A. Ensor; H. E. Cross; A. W. Adcock.	1	3 2	To India *viâ* Cape of Good Hope, returning *viâ* Suez.
"Clan Ranald," S.S....	C. F. MacIntosh ...	... ...	1	0 26	To Ceylon (outward passage only).
"Clan Urquhart," S.S.	J. A. McPherson ...	C. Henderson; D. McKinnon; R. M. Logan; E. S. A. Boddington; A. W. Bigsworth, Mid. R.N.R.	3	6 18	To India.
"Corinthic," R.M.S....	H. F. David, Lieut. R.N.R.	C. C. Cartwright	1	2 29	To New Zealand.
"Crown of Navarre," S.S.	G. Grindlay	—. Bird: —. Herschell; —. Howston	1	1 15	To West Indies.
"Dalegarth," S.S. ...	R. E. Page	D. Nash; T. Jones; D. Mack; R. Moffatt; R. Liddell; G. M. Storm; Sept. Barlow.	4	7 24	To the Eastern Mediterranean and Black Sea. / To the Baltic.
"Danube," R.M.S. ...	S. R. Dickinson ...	D. McFarlane; L. A. Steele; D. J. Browning; R. A. G. H. de Caen, Mid. R.N.R.; Julian Moffatt,	1	2 19	Between Lisbon and Monte Video.
"Den of Ogil," S.S.	H. Hemming ... ... / A. Low	G. Moodie; E. Twidle; J. W. Compton.	2	4 24 / 1 10	To Calcutta.
"Diana," S.S.... ...	H. Mackay	Martin Cadenhead	1	6 13	To Davis's Straits.
"Dilwara," S.S. ...	A. W. Mann	C. Wilson; P. Coleborn; J. A. Wright; J. E. Atkins; F. G. Bright.	3	7 15	To Cape Town, Durban, and home *viâ* Suez.
"Druidstone," S.S. ...	S. W. Decent	S. J. Lyberg; J. R. McClurry; J. Wood	2	4 29	To Black Sea and Norway.
"Dunbarmoor," S.S....	Wm. Boag Barton ...	R. Smith; R. M. Martin, Sub-Lieut. R.N.R.	1	2 29	To Monte Video, returning *viâ* West Indies and United States.
"Durham Castle," S.S.	F. J. Moseley, Lieut. R.N.R.	A. H. B. Blackman	1	1 28	To Cape Town and Durban.

METEOROLOGICAL REGISTERS received during the Year 1905-06—*continued.*

(3.)—*From the* MERCANTILE MARINE.—*Meteorological Logs*—continued.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
				Mths. Days.	
"India," S.S. (P. & O.)	F. W. Vibert, Commr. R.N.R.	H. W. A. Clark; C. D. Forbes; F. H. Ayres; F. Groome; H. E. Bickley; R. C. Dyne; R. C. Deal; A. O. Trefell; G. C. Shaw; —. Powell, C. G. Byron; W. Bain.	3	8 3	To Sydney.
"Ionic," R.M.S. ...	W. S. Atkin, Commr. R.N.R. J. O. Carter, Lieut. R.N.R.	S. Crosthwaite; W. Paul	1 2	3 0 6 2	To New Zealand.
"Italian Prince," S.S.	C. B. Anderssen ...	F. G. Pooley	1	3 23	To New York, Buenos Aires, &c.
"Jason," S.S. ...	T. G. Steeves	S. J. Phillips; T. W. Phillips. ...	2	7 1	To China, Japan, and British Columbia.
"Kaikoura," S.S. ...	R. C. Clifford	J. B. Makepeace; H. Wynyard; A. L. Rose.	1	3 3	To New Zealand.
"Kaipara," S.S. ...	H. C. Kiddle	A. L. Rose; W. B. Holdstock ...	2	6 7	To New Zealand *viâ* Cape of Good Hope returning *viâ* Cape Horn.
"Kilbrennan," S.S. ...	J. K. Wilson	D. Macfarlane; A. Richmond; A. S. Marshall.	1	4 10	To Mauritius, Calcutta, and Kurrachee.
"Kilbride," S.S. ...	T. Smith...	W. Lane; W. C. C. Plage; A. C. Dalby.	2	6 6	To Rangoon, Calcutta, &c.
"Kildonan Castle," R.M.S.	J. Tyson... ... ... B. E. H. Becker... ...	T. A. Jones; S. Symons; W. McClure Lunt; R. D. Maxwell; A. G. Lingard.	1	3 9 0 24	To Cape Town.
"Kincraig," S.S. ...	D. Campbell	J. Miller; W. Blakey; D. McIntosh.	1	3 17	To Zanzibar and Calcutta *viâ* Cape of Good Hope, returning *viâ* Suez.

"Knight of the Thistle," S.S.	G. S. Baker	H. N. Dixon; A. M. Brown; G. P. Hall.	1	4 22	To Calcutta.
"Kumara," S.S. ...	W. Scotland	W. Culbert; H. Adkins; F. Elliott; —. Levack.	2	6 11	To New Zealand.
"Lake Michigan," S.S.	G. S. Webster, Lieut. R.N.R.	J. A. Howard	2	4 0	To Canada.
"La Plata," R.M.S. ...	W. J. Dagnell	R. A. G. H. de Caen, Mid. R.N.R.; F. W. Kirby; H. Bennett; S. Braithwaite; F. R. Miles; E. A. Turner.	2	6 28	To Central America, *viâ* ports.
"Leopoldville," S.S.	R. Bower... ...	G. Puxley; T. E. Jones; L. de Bruges.	2	7 11	To the Congo.
	G. B. Sparrow ...		1	1 9	
"Loch Katrine," Barque.	Wm. Anderson	Andrew Duncan	1	6 16	To Port Adelaide.
"Loch Tay," S.S.	Jas. Stephen	H. F. Hay; W. H. Trevan; W. Yule; —. Stewart; W. Holland.	3	7 29	To India.
	T. C. Martin	A. Topp		5 13	To Australia.
"Lord Roberts," S.S.	J. B. Boal	W. L. Clibborne; J. Adams; R. L. Hatton; J. Owers.	2	7 29	To Ports in South of U.S.A.
"Lothian," S.S. ...	J. C. Williamson ...	R. Tannock; W. Jenkins; W. Riddle; C. Moersch.	1	6 4	To Durban, China and Japan.
"Macedonia," S.S. (P. & O.).	C. D. Bennett, Commr. R.N.R.	B. Ohlson; P. O. Britten; W. C. Smith; F. Sudell.	1	1 12	To Bombay.
		A. B. Armitage; H. E. Taylor ...	2	5 15	To Sydney.
"Manchester Shipper," S.S.	A. T. Haworth	W. P. Humphreys; H. H. Heraud; H. Mackinnon.	2	7 17	To Pensacola. To Montreal.
"Manistee," S.S.	H. H. Neale ...	R. S. Osborn; R. Lloyd; W. J. Swords; E. P. Green; R. Lloyd; H. Deane.	2	5 26	To Port Limon.
	J. H. H. Scudamore, Sub-Lieut. R.N.R.			1 8	
"Maori," S.S.	T. H. Chudley, Sub-Lieut. R.N.R.	—. Charman; F. E. Lambert; L. B. Gillman; S. F. Newman, Mid. R.N.R.	1	3 12	To New Zealand.
	G. Nicole ...		1	3 7	
"Matina," S.S. ...	H. Halpin	F. J. Downes	1	4 4	To Port Limon.
"Meinwen," Barque...	R. H. Potter	J. Gough; T. J. Rae; D. Romney ...	1	6 20	To Melbourne.
"Merionethshire," S.S.	C. H. Burch	—. Churchill; —. Hopkins; —. Smithers, —. Peake; —. Lewis.	2	7 14	To China and Japan.

METEOROLOGICAL REGISTERS received during the Year 1905–06—*continued.*

(3.)—*From the* MERCANTILE MARINE.—*Meteorological Logs*—continued.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
				Mths. Days.	
"Miami," S.S.	E. H. Jones	C. E. Hannay; J. Scudamore; W. Lancefield; F. P. Brond; J. D. McInnes.	2	1 5	To Costa Rica and Port Limon.
	E. W. Castle			3 12	
	D. Reside			2 5	
"Minia," S.S. ...	W. G. Squares de Carteret	J. Adams; Rbt. Wyllie; M. J. Comyn; G. H. Furneaux.	2	16 5	To Newfoundland and in Western Atlantic. (Cable laying.)
"Moeris," S.S. ...	A. Woolfall	R. W. Winder; C. A. Amburger; H. Speakman.	1	3 18	To Black Sea, &c. To Quebec (outward passage only).
"Montauk," S.S. ...	J. W. Houghton ...	H. T. Holloway	1	3 8	To Southern ports, U.S.A.
"Moravian," S.S. ...	Alex. Simpson	—. Laing; —. Corbett; H. C. Allingham, Sub-Lieut. R.N.R.; G. A. Elrick; E. S. McLaren.	2	6 11	To Australia.
"Morning," S.S. ...	W. Adams	... ...	1	6 9	To Davis's Straits.
"Mount Royal," S.S.	H. B. Boothby	H. Heald	1	0 29	To Montreal.
"Napolitan Prince," S.S.	H. Eagleton, Lieut. R.N.R.	W. H. Astley; W. P. Greenfield; G. H. Evans.	1	3 29	Between New York and Naples.
"Netherby," Ship ...	G. P. Scott	J. F. Beavitt; E. Magune; T. Evans.	1	6 15	From lat. 36° S., long. 114° W., to Delagoa Bay, Melbourne, and home.
"Nicoya," S.S. ...	W. Long	E. S. West; J. Johnston; W. T. B. Terry; R. A. Dalzell; F. H. Shani.	2	6 27	To Costa Rica and Port Limon.
"Numidian," S.S. ...	W. S. Main	J. D. Muir	1	3 17	To New York.
"Ocean Prince," S.S.	R. Kirkwood	C. R. Jowsey	2	7 24	To Mediterranean.

"Ophir," R.M.S. ...	R.N.R.	[illegible]; A. V. Drowser, Lieut. R.N.R.; D. R. W. Parsons; F. H. B. Owen; J. Avern.				
"Oracabessa," S.S.	W. Long ... ... / J. Clarke	A. E. Castle; F. E. Tordiffe; C. Morris; W. Owen.	2	2 20 / 5 9		To West Indies and ports.
"Orcadian," S.S. ...	Geo. Caie	A. Reedy; D. McQueen	2	5 26		To Buenos Aires and Quebec.
"Ormuz," R.M.S. ...	A. J. Coad, Lieut. R.N.R.	P. N. Layton, Lieut. R.N.R.; H. S. Seale; C. Matheson, Sub-Lieut. R.N.R.; W. Seymour; A. H. Fraser, Sub-Lieut. R.N.R.	2	5 16		To Australia.
"Orontes," R.M.S. ...	J. F. Ruthven	J. F. H. Healey, Lieut. R.N.R.; W. T. Cox, Lieut. R.N.R.; J. Avern; R. W. I. Marshall, Sub-Lieut. R.N.R.; W. de M. Baynham; J. Withers.	3	7 4		To Australia.
"Papanui," R.M.S. ...	T. S. Weston	W. Olphert; G. F. C. Worthington; R. Male; G. Plummer; —. Simons.	2	4 25		To New Zealand *viâ* Cape of Good Hope, returning *viâ* Cape Horn.
"Paparoa," S.S. ...	Russell Jaggard ...	N. E. Bower; C. J. Tonge; M. Paramor; P. G. Hyde; —. Mead; —. Huntriss; —. Easty.	2	6 9		To New Zealand and Tasmania.
"Persia," S.S. ...	Geo. Mitchell	G. K. Wilson; F. Howard	3	7 20		To Calcutta and Bombay.
"Port Antonio," S.S.	W. R. Rowe	G. S. Doorly; F. A. Griffiths ...	2	6 16		To West Indies.
"Port Kingston," R.M.S.	J. G. Parsons	A. Morrison; H. S. Porter; Leslie Lawlor.	2	6 10		" "
"Port Maria," S.S. ...	S. H. Simmons	A. M. Turner	2	4 19		" "
"Port Royal," R.M.S.	W. R. Rowe	G. A. Griffin; G. S. Doorly	2	3 28		" "
	Owen Jones	F. M. R. Carter...	2	6 14		" "
"Potomac," S.S. ...	A. L. Paterson	W. L. Williams; R. L. Smith; J. T. Jones.	1	1 29		To Buenos Aires.
"Radiance," S.S. ...	W. D. Jones	J. Robinson	1	0 9		To Genoa (outward passage only).
"Ramsay," S.S. ...	F. C. Mullan	R. Bailey; C. B. Matthews; W. Withe	2	6 16		To Florida, Natal, Japan, and home *viâ* Suez.
"Ranza," S.S. ...	G. H. Arnot, Lieut. R.N.R.	... ...	1	4 15		To India; thence to Philadelphia.

METEOROLOGICAL REGISTERS received during the Year 1905-06—*continued.*

(3.)—*From the* MERCANTILE MARINE.—*Meteorological Logs*—continued.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
				Mths. Days.	
"Reynolds," S.S. ...	T. A. French	R. H. Thurger; W. J. Evans; G. W. Martin; W. S. Tansley.	3	8 16	To Kurrachee *viâ* Cape of Good Hope, returning *viâ* Suez. To Black Sea. To Virginia (U.S.A.) *viâ* Spain.
"Ribera," S.S. ...	R. Hurford	M. Clifford; F. C. Harris; C. Hawick	2	5 28	To China *viâ* Cape of Good Hope, and home *viâ* Suez.
"Rimutaka," R.M.S.	H. E. Greenstreet ...	J. H. Squires; C. Milner; H. A. Dillner; P. H. Levisted.	3	8 28	To New Zealand.
"Romney," S.S. ...	R. W. Trenaman ...	J. Clubb; T. H. Wake; F. Taylor ...	2	4 23	To Buenos Aires.
"Ruapehu," S.S. ...	F. Mayoss, Lieut. R.N.R.	A. Ford; L. Martin; R. Huntriss; M. Paramor; F. S. Martin; A. G. Barnett.	2	6 6	To New Zealand.
"Saba," S.S.	H. E. Holliday	L. Holt; C. W. Mairy; H. Skellom; A. G. Maskell; P. T. Lynch.	3	6 12	To Central America.
"Sicily," S.S. ...	—. Scott	... ...	1	1 15	To British North America.
"Silverton," S.S. ...	S. P. Lister, Lieut. R.N.R.	A. R. Rust; J. Ericson	1	3 22	To Eastern Mediterranean ports.
"South America," S.S.	J. Watson	—. Day; C. McLean; —. Jenkins; J. Williams; —. Richardson.	2	7 7	To Iquique and Valparaiso.
"Tagus," S.S. ...	H. E. Rudge	C. Taylor; C. Loriard; F. Bateman	2	6 17	To West Indies and Central America.
"Tongariro," S.S.	J. A. Sutcliffe	E. B. Thornker; A. F. Beaton; W. B. Holdstock; R. R. Neale; M. Downton	2	5 27	To New Zealand.
	A. W. McKellar, Lieut. R.N.R.	R. R. Neale; E. E. Kettle; A. F. Beaton.	1	2 27	

"Tudor Prince," S.S.	J. B. Curtis	G. Williams; R. Macdonald	2	7	2	Blanca, and home. To New York, Cape Town, India, and home.
"Urmston Grange," S.S.	W. Kealake	Officers	1	3	29	To Punta Arenas. To Monte Video.
"Valentia," S.S. ...	Owen Richards... ...	R. Gray; C. S. Watson; J. L. Pennock.	2	9	16	To Iquique. To Monte Video, Baltimore, and home.
"Vectis," S.S.	F. C. A. Lyon	W. W. Warren; L. Bedwell; W. Shaw; W. Wood; C. McCoy; J. B. Browning; H. Goodier; W. Watson; S. C. Patterson; H. J. Norris, Sub-Lieut. R.N.R.	5	?	0	To Madeira, Mediterranean, and Spitzbergen (Yachting).
	F. Fox			0	12	
	A. Thompson			5	11	
"Victoria," R.M.S. (P. & O.).	R. L. Haddock, Commr. R.N.R.	S. Finch; E. H. Orchard; H. B. Northcote; A. L. Macintosh; S. Appleyard; C. Dickenson; H. Edwards.	2	8	2	To Sydney.
"Waimate," S.S. ...	J. D. Forsdick	C.W. Clement; S. J. Plummer; J. Scott.	1	4	2	To Australia and New Zealand.
"Wakanui," S.S. ...	Vivian White-Parsons..	P. P. Crawford; P. T. Perkins; P. H. Suisted; —. Whitehead; —. Tonge; —. Rose.	2	7	5	To New Zealand.
"Wellington," S.S. ...	T. A. Tait	D. Thomas; W. Donovan	2	6	21	To Eastern Mediterranean. To the Baltic.
"Whakatane," S.S. ...	L. G. Silba	A. Smith; R. K. Dodwell	1	5	1	To Australia and New Zealand.
"Winkfield," S.S. ...	T. Atkinson	W. R. Smith; D. Owen; E. M. Smith.	2	6	2	To Chile.
"Wooda," S.S. ...	H. H. Godwin	G. Evans; D. Harris; J. Shotton ...	2	6	0	To Mediterranean, Galveston, and home. To Black Sea *viâ* ports.
"Yucatan," S.S. ...	W. Harrocks	W. H. Atkinson; W. P. Evans ...	2	4	27	To West Indies and Central America.
"Zent," S.S.	E. H. Jones	W. McClay	1	3	13	To Port Limon.

(4.)—*Abbreviated Meteorological Registers.*

(a.) *From the Royal Navy* (—).

METEOROLOGICAL REGISTERS received during the Year 1905–06—*continued*.

(4.)—*Abbreviated Meteorological Registers*—continued.

(b.) *From the Mercantile Marine* (20).

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.		Voyage.
				Mths.	Days.	
"Arana," S.S.... ...	R. Walton	A. Newton Mell	5	4	10	To the Mediterranean (4). To Monte Video.
"Foylemore," S.S. ...	E. Ellis	G. Holmes	2	3	4	To River Plate. To Mediterranean Ports.
"Hinemoa," S.S. ...	... ...	... ...	1	11	28	In New Zealand waters.
"Induna," S.S. ...	F. J. Bayldon, Sub-Lieut. R.N.R.	... ...	3	5	3	Between Sydney (N.S.W.) and New Hebrides.
"Kamona," S.S. ...	C. Suffeon	... ...	1	16	6	In New Zealand waters.
"Malaita," S.S. ...	F. J. Bayldon, Sub-Lieut. R.N.R.	... ...	2	2	22	Between Sydney (N.S.W.) and New Hebrides.
"Oro," S.S.	W. Ransom Coleman ...	J. P. Allix	1	2	5	To China and Japan (outward passage).
"Rakanoa," S.S. ...	G. Holford	... ...	1	0	21	Between New Zealand, Fiji, and Australia.
"Tambo," S.S. ...	F. J. Bayldon, Sub-Lieut. R.N.R.	... ...	1	1	11	Between Sydney (N.S.W.) and New Hebrides.
"Tutanekai," S.S. ...	... ...	... ...	1	17	26	In New Zealand waters.
"Waikato," S.S. ...	H. C. Kiddle	... ...	1	0	23	New Zealand to Cape Horn.
"Zealandia," S.S. ...	... ...	... ...	1	1	25	Between Australia and New Zealand.

METEOROLOGICAL REGISTERS received during the year 1905-06 —*continued.*

(5.)—North Atlantic Registers (Form No. 51)—*continued.*

Line.	Ship.	Captain.	No. of Registers.
Atlantic Transport—*cont.*	Mackinaw	W. H. Whittle, Sub-Lieut. R.N.R.	15
	Manhattan	E. G. Cannons	6
	Maryland ...	W. H. Whittle, Sub-Lieut. R.N.R. J. T. J. Wylie ... ... O. P. Clarke	14
	Menominee	C. H. Stapleton, Lieut. R.N.R.	9
	Mesaba	F. W. Tubb	14
	Minneapolis	T. F. Gates	24
	Minnehaha	J. Robinson	21
	Minnesota ...	W. T. J. Wylie ... ... P. Laverock	14
	Minnetonka	S. Layland	24
	Montana... ...	W. Johnston ... ... J. McMath	13
"Bellailsa" S.S. Co.	Bellailsa...	O. O. Aagaard	7
"Bellona" S.S. Co.	Bellona	F. Rollo	5
Blue Anchor ...	Wilcannia	W. G. Lingham ...	3
Booth S.S. Co. ...	Boniface...	G. B. Westray	1
	Dominic...	W. Smale	7
Bowring, C. T. & Co.	Roda	W. R. Bennett	1
Bristol "City"...	Chicago City	W. M. Hunter	1
	Jersey City	R. Frankland	1
Buenos Ayres and Great Southern Railway Co.	Frank Parish	... ...	2
Canadian-Pacific Railway Co.	Lake Erie	F. Carey	22
	Lake Manitoba... ...	J. A. Murray	19
	Lake Michigan	G. S. Webster, Lieut. R.N.R.	13
	Milwaukee	J. H. Moore	10
	Monmouth ...	C. E. Birchman... ... H. G. Potter	13
	Montcalm	E. Hodder	18
	Monteagle	H. Parry...	9
	Montfort	A. E. Evans	4
Chesapeake and Ohio S.S. Co.	Powhatan	E. Trinick	8
Clan	Clan McLeod	W. J. Lennox	3
	Clan Macneil	S. Beer	2
	Clan McPherson ...	S. Beer	1
	Clan Stuart	W. J. Lennox	14

TEOROLOGICAL REGISTERS received during the year 1905–06 —*continued.*

(5.)—North Atlantic Registers (Form No. 51)—*continued.*

Line.	Ship.	Captain.	No. of Registers.
apagnie Géné- ale Transat- antique.	La Lorraine	A. Alix	10
	La Touraine	—. Fajolle	8
:own" S.S. Co.	Crown of Navarre ..	G. Grindlay	5
an S.S. Co. ...	Cayo Soto	E. C. Radder	2
ard	Campania ...	J. Pritchard	12
		R. C. Warr	
	Carmania	J. Pritchard	8
	Caronia	R. C. Warr	19
		J. C. Barr	
	Carpathia	E. Pentecost	10
	Cypria	J. Barlow	8
	Etruria	T. Potter	14
	Ivernia	W. Turner	26
	Lucania	J. B. Watt	8
	Pannonia	H. M. Benison, Lieut. R.N.R.	10
	Pavia	C. A. Smith, Lieut. R.N.R.	10
	Saxonia	D. Dow	19
		J. T. W. Charles, Lieut. R.N.R.	
	Slavonia	J. T. W. Charles, Lieut. R.N.R.	9
	Sylvania...	W. B. Cresser	8
	Tyria	J. S. Carbines	13
	Umbria	T. Stephens	13
		D. Dow	
	Veria	T. Hewitson	4
[illegible]a" S.S. Co.	Devona	D. R. Murray	15
[illegible]on ...	Canada	R. O. Jones	18
		J. H. Kay	
	Cornishman	J. H. A. Thornton ...	16
	Irishman	W. Roberts	8
	Kensington ...	M. H. Morle	9
		R. O. Jones	
	Norseman	J. Evans...	7
	Southwark	J. O. Williams	10
	Vancouver	J. Evans...	1
der, Dempster	Addah	W. E. Potter	2
	Egwanga	J. C. Hannay	2
	Port Antonio	W. R. Rowe	15
	Port Maria	S. H. Simmons	3
	Port Morant	O. Jones...	2
	Port Royal	O. Jones...	18
	Sobo	H. A. Yardley	2
	Sokoto	A. Lobb	2
	Zaria	R. Roberts	4

METEOROLOGICAL REGISTERS received during the year 1905-0[illegible] —*continued.*

(5.)—North Atlantic Registers (Form No. 51)—*continued.*

Line.	Ship.	Captain.	No. of Registers
Elders & Fyffes...	Chickahominy	J. H. H. Scudamore, Sub-Lieut. R.N.R.	4
	Greenbrier	D. Reside	6
	Manistee... ...	H. Neale...	16
		J. H. H. Scudamore, Sub-Lieut. R.N.R.	
	Matina	H. Halpin	7
		E. W. Castle	
	Miami	D. Reside	5
	Nicoya	W. Long...	10
	Zent	E. H. Jones	8
Ellerman ...	City of Khios	D. Cruickshank ...	5
English & American Shipping Co.	Mokta	E. E. Cooper	5
European Petroleum Co.	Baku Standard... ...	H. Tucker	1
	Broadmayne	H. A. Hayns	9
Fargrove Steam Navigation Co.	Caldy	W. C. Davison	1
(Foreign) ...	Canadia	E. Horn	3
	Dania	P. Paulsen	8
		A. Hansen	
Furness, Sir C. ...	Cynthiana	E. Evans...	2
Glynn, J. ...	Albiana	E. Trinick	2
Gulf Transport...	Imani	T. B. Peabody	10
	Indore	C. Mytton	14
	Irada	A. W. Roberts, Lieut. R.N.R.	15
	Irak	A. Delargy	9
	Iran	C. M. M. Jacob... ...	1
	Istrar	G. F. Perks	8
		C. M. M. Jacob... ...	
Harrison ...	Colonial	C. S. Rhodes	9
	Counsellor	D. G. Cownie	2
	Historian	J. Valiant	5
	Logician...	R. Owen...	3
	Musician	G. B. Woolfenden ...	5
Holman, R. H. ...	Archtor	H. Sydney	6
Houston... ...	Hostilius	H. R. C. Lockyer ...	5
"Hurona" S.S. Co.	Hurona	J. Dorward	16
"Jacob Bright" S.S. Co.	Jacob Bright	L. Anderson	2

METEOROLOGICAL REGISTERS received during the year 1905–06 —*continued.*

(5.)—North Atlantic Registers (Form No. 51)—*continued.*

Line.	Ship.	Captain.	No. of Registers.
Pyman S.S. Co. ..	Rokeby	H. Wheatley	2
	Waverley	H. Wheatley	6
Red Star... ...	Vaderland	R. C. Ehoff	19
Ropner	Kirkby	O. N. Pettersson ...	10
Royal Mail Steam Packet Co.	Atrato	R. H. Stranger	9
	Danube	L R. Dickinson	1
	Dee	F. H. M. Custance, Lieut. R.N.R.	1
	La Plata	W. J. Dagnall	4
	Magdalena ...	J. Pope ... ... / A. P. Dix	14
	Orinoco	C. E. Down	11
	Thames	H. E. Rudge	11
	Trent	A. C. Farmer ... ... / J. Pope	12
Toronto Trading Co.	Cameron	T. Foley	1
Ulster S.S. Co. ...	Carrigan Head	S. Orr	11
Union-Castle ...	Braemar Castle...	D. Wallace ... ... / S. Henderson, Lieut. R.N.R.	4
	Briton	J. W. Creaghe	12
	Carisbrook Castle ...	T. J. Bremner	1
	Galeka	T. H. Wilford	7
	Guelph	R. Walls... ... ... / L. W. Bayldon, Commr. R.N.R.	8
	Kildonan Castle ...	J. Tyson	8
White Star ...	Arabic	W. S. Atkin	4
	Armenian ...	F. B. Howarth ... ... / F. E. Beadnell ... ... / J. B. Kelk ... ... / E. C. Roberts	13
	Baltic	E. J. Smith, Commr. R.N.R.	12
	Bovic	D. Kerr	13
	Canopic	I. Sealby, Lieut. R.N.R.	12
	Cedric	H. J. Haddock, C.B., Commr. R.N.R. / J. G. Cameron	22
	Celtic	J. B. Ranson, Lieut. R.N.R.	19
	Cevic	W. H. Clarke	18
	Cretic	J. Kelk	3
	Cymric	F. E. Beadnell	11
	Georgic	F. R. Clarke, Lieut. R.N.R.	10
	Majestic	B. F. Hayes, Lieut. R.N.R.	22
	Oceanic	J. G. Cameron, Lieut. R.N.R.	10

METEOROLOGICAL REGISTERS received during the year 1905–06 —*continued.*

(5.)—North Atlantic Registers (Form No. 51)—*continued.*

Line.	Ship.	Captain.	No. of Registers.
White Star—*cont.*	Republic	J. McAuley	18
	Runic	D. Thomas	5
	Teutonic... ...	J. B. Ranson, Lieut. R.N.R.	16
		T. P. Thompson ...	
	Victorian	F. Hart, Lieut. R.N.R ...	11
Westall, J. ...	Virent	G. Alexander	2
Wilsons & Furness-Leyland.	Cambrian ...	J. O. Williams	9
		E. C. Hiscoe	
	Georgian	R. Farrington	13

APPENDIX V.

INSTRUMENTS supplied, &c., to MERCANTILE MARINE.

Particulars.	Barometers.	Thermometers.	Hydrometers.	Screens.
April 1st, 1905, afloat	183	1,303	756	212
Issued since	62	425	214	46
	245	1,728	970	258
Returned since	53	282	135	32
	192	1,446	835	226
Written off as broken or lost since 1900.	24	385	164	51
April 1st, 1906, afloat	168	1,061	671	175

DISPOSITION of MERCANTILE MARINE INSTRUMENTS, April 1st, 1906.

Particulars.	Barometers.	Thermometers.	Hydrometers.	Screens.
In merchant ships	168	1,061	671	175
„ store at M.O.	1	24	3	12
At Liverpool Agency	3	25	28	—
„ Glasgow „	4	6	20	4
„ Dundee „	5	14	9	3
„ Hull „	6	32	19	6
„ Cardiff „	6	49	27	7
„ Southampton „	3	18	11	5
„ Sunderland „	2	18	9	3
Total April 1st, 1906	198	1,247	797	215
Under repair, April 1st, 1906 ...	1	—	—	—

INSTRUMENTS at STATIONS, viz.: Telegraphic Reporting Stations, Observatories, Fishing Villages, etc.

(*a.*) THERMOMETERS AND SCREENS.

	Thermometers.					
	Ordinary.	Maximum.	Minimum.	Solar.	Grass Minimum.	Screens.
April 1st, 1905, in use ...	419	72	80	11	11	116
Issued since	31	6	7	1	2	3
	450	78	87	12	13	119
Returned since ...	13	6	6	—	3	—
Written off as broken or lost since 1900.	86	—	13	—	—	—
April 1st, 1906, in use ...	351	72	68	12	10	119

APPENDIX VI.

REPORT ON THE INSPECTION OF STATIONS IN CONNEXION WITH THE OFFICE IN 1905.

The Inspectors were as follows :—

Observatories and Anemograph Stations.	Mr. T. W. Baker and Mr. E. G. Constable, by arrangement with the Director of the National Physical Laboratory, and Mr. R. H. Curtis.
Districts 0, 1 and 6	Dr. A. Buchan.
„ 2 and part of 4 ...	Mr. F. J. Brodie, Mr. W. Marriott.
„ 3	Mr. H. Harries, Mr. W. Marriott.
„ 5 and part of 4 ...	Capt. Hepworth.
„ 7 „ „ 4 ...	Mr. R. H. Curtis, Mr. W. Marriott.
„ 8 and parts of 7 and 4	Mr. J. A. Curtis.
„ 9 and 10	Mr. R. G. K. Lempfert.

Mr. G. C. Simpson inspected some of the telegraphic reporting stations, which he visited for the purpose of collecting material for his report on the Beaufort scale of wind force.

At the observatories and anemograph stations the instruments were dismounted and cleaned, and all necessary repairs were carried out. At those observatories which are also climatological or telegraphic reporting stations the arrangements for this work was also examined.

The Reports show that efficiency has been maintained as a whole ; in a number of cases the inspectors were able to make suggestions for improving the observations by bringing them more into line with recognized conventions.

The following is a list of stations inspected and approved :—

OBSERVATORIES.

Aberdeen.
Armagh.
Falmouth.
Glasgow.
Kew.
Oxford.
Stonyhurst.
Valencia.

ADDITIONAL ANEMOGRAPH STATIONS.

Deerness.
Dublin (Phœnix Park).
Fleetwood.
Falmouth (Pendennis Castle.)
Holyhead.
Kingstown.
North Shields.
Scilly.

HYGROGRAPH STATION.

Cambridge (Newnham College).

Normal Climatological Stations.

Armagh.
Birmingham.
Birr Castle.
Braemar.
Buxton.
Cally.
Canterbury.
Cheadle (Staffs.).
Clathick.
Clongowes Wood.
Deerness.
Dublin.
Dundee (Phœnix Park).
Dunrobin Castle.
Eastbourne.
Glasgow.
Hillington.
Lairg.
Lincoln.
Lowestoft.
Newton Rigg.
Poltalloch.
Ridgmont (Woburn).
Rothesay.
Rounton.
Scarborough.
Seaham.
Stokesay.
Stonyhurst.
Strathpeffer Spa.
Wakefield.
Whitby.
Wolfelee.
York.

Auxiliary Climatological Stations.

Aberdovey (sunshine only).
Aberystwyth.
Barnet.
Blackpool.
Bucklebury Place (Herts).
Buntingford.
Carnforth.
Cirencester.
Clifton.
Darwen.
Felixstowe.
Folkestone.
Giggleswick.
Huddersfield.
Llangammarch Wells.
Littlestone-on-Sea.
Nottingham Castle.
Portsmouth.
Rhyl.
Ruardean Hill, Forest of Dean (rainfall only).
Saltburn-by-the-Sea.
Towyn.
Whitemead Park, Forest of Dean (rainfall only).
York, Deighton Grove (rainfall only).
„ Bootham (sunshine only).

Telegraphic Reporting Stations.

Aberdeen.
Birr Castle.
Blacksod Point.
Donaghadee.
Dungeness.
Holyhead.
Leith.
Malin Head.
Nairn.
Nottingham.
Pembroke.
Portland Bill.
Roche's Point.
Scilly.
Shields, North.
Spurn Head.
Stornoway.
Valencia.
Wick.

Special Report of the Inspection of the Scottish Stations.

By Dr. Buchan.

Barometers.—The barometers at the stations were compared with inspector's standard No. 690, which continued to be in good order during the inspection as compared with the standard barometer in Edinburgh before and after the inspections. The observers continue to read carefully and correctly.

Thermometers.—As usual, these instruments were read twice, first by the observer and inspector as they hang in the screen, and then by the inspector after being in water for the time specified in the table. The minimum thermometer at Nairn was much out of order. It went out of order the day before my visit, but nothing was done with it till my arrival, when Miss Penny set it right at once. The maximum thermometer was very slightly out of order, but was put right. Otherwise the thermometers at the other stations were in good order.

Hygrometers.—From the readings on immediately opening the screen it was plain that these instruments were in good order at all stations. Some of the observers are carefully noting the cases where the wet bulb is the higher of the two, occurring in cases when temperature is falling rapidly.

APPENDIX VII.

GEOGRAPHICAL LIST OF INSTITUTIONS AND PERSONS FROM WHOM PUBLICATIONS CONTAINING Meteorological Data HAVE BEEN RECEIVED DURING THE LAST THREE YEARS.

The list is arranged in accordance with the topographical classification adopted in the International Catalogue of Scientific Literature. *In each section the names of institutions which collect observations from a network of stations, or which publish observations on an extended scale, have been placed first.* In a number of instances, particularly in the case of tropical countries, observations are published by authorities not domiciled in the country. In these instances the names of the places of observation have been given as far as space permits, and the names of the institutions issuing the publications have been printed in *italic* type. If no names of places are quoted, it may be assumed that returns from a number of stations are given.

The character of the information available has been indicated by quoting the numbers in the International Catalogue under which the publications have been classified.

The year quoted is the latest for which the information has been received.

The classification numbers employed are as follows :—

1710 and 1730. Climatology—Agricultural and Hygienic.

1180. Rainfall Tables.

1800. Meteorological Registers—General.

1810. Hourly Values.

1820. Daily Values.

1830. Daily Weather Reports.

1840. Weather Reports other than Daily.

1870. Meteorological Charts.

It should be understood that Meteorological Registers—General (1800) are usually in the form of Monthly Summaries.

GEOGRAPHICAL LIST OF INSTITUTIONS AND PERSONS SUPPLYING PUBLISHED METEOROLOGICAL DATA

NAME OF INSTITUTION, &c.	1710 & 1730. Climatology—Agricultural and Hygienic.	1180. Rainfall Tables.	1800. Meteorological Registers—General.	1810. Hourly Values.	1820. Daily Values.	1830. Daily Weather Reports.	1840. Weather Reports other than Daily.	1870. Meteorological Charts.
GENERAL.								
International Committee for Scientific Aeronautics, Strassburg.	—	—	1905	—	—	—	—	—
Board of Trade, London—Commercial, Labour, and Statistical Department.	—	—	1902	—	—	—	—	—
d. **EUROPE AND MEDITERRANEAN ISLANDS.**								
da. **Scandinavia: Sweden, Norway, Denmark:—**								
Dansk Meteorologisk Institut (Copenhagen).	—	—	1905	—	1905	1905	1905	—
Norsk Meteorologisk Institut (Christiania).	—	1904	1904	1904	1904	—	1904	—
Svensk Meteorologisk Institut (Stockholm).	—	—	—	—	—	—	1905	—
Stockholm, K. Svenska Vetenskaps-Akademie.	—	—	1904	—	1904	—	—	—
Upsala, Observatoire Météorologique de l'Université.	—	—	1904	1904	1904	—	—	—
db. **Russia in Europe:—**								
Observatoire Physique Central Nicolas (St. Petersburg).	—	—	1902	1902	1902	1905	1904	—
Finland, Institut Météorologique Central de la Société des Sciences (Helsingfors).	—	—	—	1900	1894	—	—	—
Kaiserliche Livländische Gemeinnützige u. Ökonomische Sozietät, Dorpat (Jurjef).	—	1900	—	—	—	—	—	—
Dorpat, Meteorologisches Observatorium.	—	—	1903	1903	1903	—	—	—
Dorpat, Station Météorologique de l'École Reale.	—	—	—	—	1905	—	—	—
Kazan, Observatoire Météorologique.	—	—	—	—	1902	—	—	—
Kieff, Observatoire Météorologique.	—	—	—	—	1904	—	—	—
Moscow (E. Leyst)	—	—	1903	—	—	—	—	—
Moscow, Meteorologisches Observatorium der K. Universität	—	—	—	1902	1902	—	—	—
Odessa, Observatoire Météorologique et Magnétique de l'Université Impériale.	—	1902	—	—	1903	—	—	—
St. Petersburg, Observatoire Météorologique de l'Institut Forestier Impériale.	—	—	—	—	1904	—	—	—
Tiflis, Physical Observatory ..	—	—	—	—	—	—	1904	—
Warsaw, Station Centrale Météorologique du Musée de l'Industrie et de l'Agriculture.	—	—	1900	—	1900	—	—	—

Appendix VII.—Institutions, &c., supplying Meteorological Data.

GEOGRAPHICAL LIST—*continued.*

NAME OF INSTITUTION, &c.	1710 & 1730. Climatology—Agricultural and Hygienic.	1180. Rainfall Tables.	1800. Meteorological Registers—General.	1810. Hourly Values.	1820. Daily Values.	1830. Daily Weather Reports.	1840. Weather Reports, other than Daily.	1870. Meteorological Charts.
EUROPE AND MEDITERRANEAN ISLANDS—*cont.*								
German Empire:—								
Deutsche Seewarte (Hamburg)	—	—	1904	1904	1904	1905	1905	—
Prussia, K. Meteorologisches Institut (Berlin).	—	1901	1901	1901	1901	—	1905	—
Alsace-Lorraine, Meteorologischer Landesdienst (Strassburg).	—	—	1901	1901	1901	—	1905	—
Berlin, Central Bureau für Meteorologie und Hydrographie (Carlsruhe).	—	1905	1905	—	1904	—	1905	—
Bavaria, K. Meteorologische Central Station (Munich).	—	—	—	—	—	1905	—	—
Hessen, G. Hydrographisches Bureau (Darmstadt).	—	1904	1904	1904	1904	—	1905	—
Saxony, K. Meteorologisches Institut (Dresden).	—	—	1901	1901	1901	1905	1904	—
Württemberg, K. Statistisches Landesamt und Meteorologische Central Station (Stuttgart).	—	—	1905	1900	1901	—	1905	—
Aachen, Meteorologisches Observatorium.	—	—	1904	1904	1904	1905	—	—
Berlin, Wetter Bureau	—	—	—	—	—	1905	—	—
Bremen, Meteorologische Station	—	—	—	1904	—	—	—	—
Eberswalde, Meteorologische Station.	—	—	—	—	—	—	1903	—
Emden, Naturforschende Gesellschaft.	—	—	1903	—	—	—	—	—
Frankfurt am Main, Physikalischer Verein.	—	—	—	—	1903	—	—	—
Holland; Belgium; Luxemburg:—								
Nederlandsch Meteorologisch Institut (de Bilt).	—	—	1903	1903	1903	1905	1905	—
Observatoire Royal, Uccle, Brussels.	—	—	—	—	—	1905	—	—
United Islands:—								
Meteorological Office (London)	—	—	—	1902	1900	1905	1905	—
British Rainfall (H. R. Mill) ..	—	1904	—	—	—	—	—	—
Meteorological Society (London)	—	—	1904	—	1904	—	1904	—
Scottish Meteorological Society (Edinburgh).	—	1903	1903	—	—	—	—	—
Royal Society of Edinburgh [Ben Nevis and Ben Nevis].	—	—	—	1897	—	—	—	—
Royal Observatory, Greenwich	—	—	1903	1903	1903	—	—	—
Registrar General's Office, London	1905	—	—	—	—	—	—	—
Registrar General's Office, Dublin	1905	—	—	—	—	—	—	—
Registrar General's Office, Edinburgh	1905	—	—	—	—	—	—	—
Board of Agriculture and Fisheries, London.	1905	—	—	—	—	—	—	—
Medical Officer of Health	1904	—	—	—	—	—	—	—
Local Public Health Office	1904	—	—	—	—	—	—	—

GEOGRAPHICAL LIST—*continued*

NAME OF INSTITUTION &c.	1710, & 1790, Climatology, Agricultural and Hygienic.	1180, Rainfall Tables.	1840, Meteorological Registers (General).	1810, Hourly Values.	1830, Daily Values.	1850, Daily Weather Reports.	1940, Weather Reports, other than Daily.	1870, Meteorological Charts.
d. EUROPE AND MEDITERRANEAN ISLANDS—*cont.*								
d. British Islands—*cont.*								
Bognor, Climatological Society	—	—	1904	—	—	—	—	—
Bolton, The Museums and Meteorological Observatory	—	—	1905	—	—	—	1905	—
Brighton, Medical Officer of Health	1904	—	—	—	—	—	—	—
Canterbury (A. Lander	—	—	1904	—	—	—	—	—
Cardiff, Naturalists' society	—	1904	1904	—	—	—	—	—
Cardiff, Waterworks Engineer's Office.	—	1905	1905	—	—	—	—	—
Chester (J. C. Mitchell) .. .	—	—	1905	—	—	—	—	—
Coventry, Medical Officer of Health.	1904	—	—	—	—	—	—	—
Croydon, Natural History and Scientific society.	—	1904	—	—	1904	—	—	—
Devon, North (T. Wainwright) ..	—	—	—	—	—	—	1905	—
Dorset (H. S. Eaton)	—	1905	—	—	—	—	—	—
Eastbourne, Borough Meteorologist.	—	—	1904	—	—	—	—	—
Falmouth, R. Cornwall Polytechnic Society.	—	—	1904	—	—	—	—	—
Great Central Railway	—	1905	—	—	—	—	—	—
Guernsey (A. Collenette) ..	—	1904	—	—	—	—	—	—
Hastings, Borough Meteorologist	—	—	1904	—	—	—	—	—
Hertfordshire (J. Hopkinson) ..	—	1904	1904	—	—	—	—	—
Hoylake and West Kirby, Urban District Council.	—	—	1905	—	—	—	—	—
Isle of Man (A. W. Moore) ..	—	—	—	—	—	—	1904	—
Jersey, Observatoire St. Louis ..	—	—	—	1905	1905	—	—	—
Liverpool Observatory, Bidston.	—	—	—	—	1904	—	—	—
Lowestoft, Medical Officer of Health.	1904	—	—	—	—	—	—	—
Manchester, Public Health Office	1904	—	—	—	—	—	—	—
Margate, Medical Officer of Health.	1904	—	—	—	—	—	—	—
[Netley.] Army Medical Department, London.	—	—	1903	—	—	—	—	—
Northampton, Natural History Society.	—	1904	1904	—	—	—	—	—
Norwich (A. W. Preston) ..	—	—	1904	—	—	—	—	—
Nottingham (A. Brown and P. Boobbyer).	—	1905	1905	—	—	—	—	—
Nottingham, Rural District Council of Basford.	1903	—	1903	—	—	—	—	—
Rousdon Observatory	—	—	1903	—	—	—	—	—
Rugby School Natural History Society.	—	—	1905	—	—	—	—	—
Sevenoaks (W. W. Wagstaffe) ..	—	—	1905	—	—	—	—	—
Southport, Fernley Observatory	—	—	1904	—	1905	—	—	—
Stonyhurst College Observatory	—	—	1904	—	—	—	—	—
Throcking (C. W. Harvey) ..	—	—	1904	—	—	—	—	—
Totland Bay, Isle of Wight (J. Dwyer).	—	—	1905	—	—	—	—	—
Truro, Cornwall County Council, Sanitary Committee.	1905	—	1905	—	—	—	—	—
Waterford (C. E. Perceval Bolton).	—	—	—	—	—	—	1905	—
Whitchurch (E. E. Glyde) ..	—	—	1904	—	—	—	—	—
Workshop (H. Mellish)	—	—	1905	—	—	—	—	—
York, Yorkshire Philosophical Society	—	—	1904	—	—	—	—	—

GEOGRAPHICAL LIST—*continued.*

NAME OF INSTITUTION, &c.	1710 & 1730. Climatology—Agricultural and Hygienic.	1180. Rainfall Tables.	1800. Meteorological Registers—General.	1810. Hourly Values.	1820. Daily Values.	1830. Daily Weather Reports.	1840. Weather Reports, other than Daily.	1870. Meteorological Charts.
d. EUROPE AND MEDITERRANEAN ISLANDS—*cont.*								
df. France and Corsica:—								
Bureau Central Météorologique de France (Paris).	—	1903	1902	1902	1902	1905	1905	—
Avignon, Commission Météorologique du Département de Vaucluse.	—	—	1903	—	—	—	—	—
Beaulieu, Sèvres et Vacquey (G. Eiffel).	—	—	1903	—	1905	—	—	—
Bordeaux, Commission Météorologique de la Gironde.	—	1905	—	—	1905	—	—	—
Lyons, Commission départementale de Météorologie du Rhône.	—	1899	—	—	—	—	—	—
Marseilles, Commission de Météorologie du Département des Bouches-du-Rhône.	—	—	1904	—	1904	—	—	—
Paris, Observatoire Municipal (Observatoire de Montsouris).	—	—	—	—	1903	—	—	—
Paris, Service Hydrométrique du Bassin de la Seine.	—	1903	—	—	—	—	—	—
Perpignan, Commission Météorologique.	—	1900	—	—	1903	—	—	—
Spain and Portugal:—								
Instituto Central Meteorológico (Madrid).	—	—	—	—	—	1905	—	—
Observatorio Do Infante D. Luiz (Lisbon).	—	—	1900	—	1903	1905	—	—
Coimbra, Observatorio Meteorologico e Magnetico da Universidade.	—	—	—	1901	1901	—	—	—
Gibraltar. *Army Medical Dep., London.*	—	—	1903	—	—	—	—	—
Llinas, Observatorio Belloch ..	—	—	1903	—	—	—	—	—
Madrid, Observatorio	—	—	—	—	1901	—	—	—
Madrid, Chamartin de la Rosa, Observatorio Meteorológico del Colegio de Nuestra Señora del Recuerdo.	—	—	—	—	1905	—	—	—
Oña, Observatorio	—	—	—	—	1905	—	—	—
Oporto, Observatorio Meteorologico da Princeza D. Amelia.	—	—	1905	—	—	—	—	—
San Fernando, Instituto y Observatorio de Marina.	—	—	—	1904	—	—	—	—
Italy: Sicily and Sardinia:—								
Ufficio Centrale Meteorologico e Geodinamico Italiano (Rome).	1905	—	1892	—	—	1905	—	—
Bologna, Osservatorio della R. Università.	—	—	—	—	1903	—	—	—
Catania (A. Riccò e L. Mendola)	—	—	1904	—	—	—	—	—
Florence, R. Museo di Fisica e Storia Naturale.	—	—	—	—	1903	—	—	—
Messina, Osservatorio	—	—	—	—	1904	—	—	—

GEOGRAPHICAL LIST—*continued.*

NAME OF INSTITUTION, &c.	1710 & 1780. Climatology—Agricultural and Hygienic.	1180. Rainfall Tables.	1800. Meteorological Registers—General.	1810. Hourly Values.	1820. Daily Values.	1830. Daily Weather Reports.	1840. Weather Reports.
d.* EUROPE AND MEDITERRANEAN ISLANDS—*cont.							
dh.* Italy: Sicily and Sardinia—*cont.							
Milan, R. Osservatorio Astronomico di Brera.	—	—	—	—	1904	—	—
Naples, R. Osservatorio di Capodimonte.	—	—	—	—	1905	—	—
Riposto, Osservatorio Meteorologico del R. Instituto Nautico.	—	—	—	—	1905	—	—
Rome, Specola Vaticana	—	—	—	—	1905	—	—
Turin, Osservatorio della R. Università.	—	—	—	—	1904	—	—
Venice, Osservatorio Meteorologico del Seminario Patriarcale.	—	—	—	—	1904	—	—
***di.* Switzerland:—**							
Schweizerische Meteorologische Central Anstalt (Zürich).	—	1903	1903	1903	1903	1905	—
Berne, Eidgenössisches Oberbauinspectorat, Hydrometrische Abteilung.	—	1903	1903	—	—	—	—
Davos Traffic Association ..	—	—	—	—	1905	—	19
Genève et le Grande St. Bernard (R. Gautier).	—	—	—	—	1904	—	—
Lausanne, Institut Agricole ..	—	—	—	—	1904	—	—
St. Moritz (R. Gautier et H. Dualme).	—	—	—	—	1903	—	—
***dk.* Austria-Hungary, with Bosnia and Herzegovina:—**							
K. K. Central Anstalt für Meteorologie und Erdmagnetismus (Vienna).	—	—	1903	1903	1904	1905	—
K. K. Hydrographischer Dienst in Österreich (Vienna).	—	—	—	—	1902	—	19
Hydrographisches Amt der K. K. Kriegs-Marine (Pola).	—	—	1904	1904	1905	—	—
K. Ung. Reichs-Anstalt für Meteor. und Erdmagn. (Budapest).	—	1901	1901	1901	1901	—	—
Bosnisch-Hercegovinische Landesregierung (Sarajevo).	—	—	1901	1901	1901	—	—
Agram, Meteorologisches Observatorium.	—	—	1902	1902	1902	—	—
Budapest, Magyar Kir. Országos Meteor. Intézet.	—	—	—	—	1905	1905	—
Cracow, C. K. Akademii Umiejętnosci u. Krakowie.	—	—	—	—	1902	—	—
Cracow, K. K. Sternwarte ..	—	—	—	—	1905	—	—
Cracow, Obserwatoryum ..	—	—	1904	—	—	—	—
Fiume, K. K. Marine-Akademie	—	—	—	—	1905	—	—
Innsbruck, Meteorologisches Observatorium.	—	—	1902	—	—	—	—
Klagenfurt (F. Jäger)	—	—	—	—	1905	—	—
Kremsmünster, Sternwarte ..	—	—	1904	1904	—	—	—
Prague, K. K. Sternwarte ..	—	—	—	—	1904	—	—
Trieste, [I.R.] Osservatorio Astronomico-Meteorologico.	—	—	1902	1902	1902	—	—
Vienna, K. K. Sternwarte ..	—	—	—	—	1903	—	—

GEOGRAPHICAL LIST—*continued.*

	NAME OF INSTITUTION, &c.	1710 & 1730. Climatology—Agricultural and Hygienic.	1180. Rainfall Tables.	1800. Meteorological Registers—General.	1810. Hourly Values.	1820. Daily Values.	1830. Daily Weather Reports.	1840. Weather Reports, other than Daily.	1870. Meteorological Charts.
d.	**EUROPE AND MEDITERRANEAN ISLANDS**—*cont.*								
dd.	**Balkan Peninsula:—**								
	Institutul Meteorologic al Romaniei (Bucharest).	1905	1905	—	—	—	1905	1905	—
	Belgrade, Observatoire Central	—	1903	—	—	—	—	1903	—
	Monastir. *Bureau Central Mét., Paris.*	—	—	1902	—	—	—	—	—
	Roumania (S.C. Hepites)	—	1903	—	—	—	—	—	—
	Saloniks. *K. K. Central-Anstalt für Meteorologie, Vienna.*	—	1903	—	—	—	—	—	—
	Sofia, Station Centrale Météorologique de Bulgarie.	—	—	—	—	—	—	1904	—
dm.	**Mediterranean and Islands:—**								
	Cyprus Public Works Department (Nicosia).	—	1905	1902	—	—	—	1905	—
	Meteorological Office, London ..	—	—	—	—	—	—	—	1905
	Malta and Cyprus. *Army Medical Dep., London.*	—	—	1903	—	—	—	—	—
	Minorca and Malta. *Bureau Central Mét., Paris.*	—	—	1902	—	—	—	—	—
e.	**ASIA AND MALAY ARCHIPELAGO.**								
ea.	**Asiatic Russia:—**								
	Observatoire Physique Central Nicolas (St. Petersburg).	—	—	1902	1902	1902	—	—	—
eb.	**China and Dependencies: Tibet, Corea:—**								
	Hong-Kong. Observatory ..	—	—	1904	1904	1905	—	—	—
	Hong-Kong and Wei-hai-wei. *Army Medical Dep., London.*	—	—	1904	—	—	—	—	—
	Ou-tochang. *K. K. Central-Anstalt für Meteorologie, Vienna.*	—	—	1903	—	—	—	—	—
	Peking, Inspectorate General of Customs.	1904	—	—	—	—	—	—	—
	Tsingtau (Shantung), *Deutsche Seewarte, Hamburg.*	—	—	—	—	1901	—	—	—
	Yunnan-Sen. *Bureau Central Mét., Paris.*	—	—	1902	—	—	—	—	—
	Zikawei, Observatoire Magnétique et Météorologique.	—	—	—	1902	—	—	—	—
ec.	**Japanese Islands, Formosa:—**								
	Central Meteorological Observatory (Tokio).	—	—	1904	1904	1904	1905	—	—
	Mizusawa, International Latitude Observatory.	—	—	1904	—	—	—	—	—
ed, ee.	**Cochin China: Tonquin, Annam, Siam:—**								
	Bureau Central Mét., Paris ..	—	1902	1902	—	1902	—	—	—

GEOGRAPHICAL LIST—*continued*.

NAME OF INSTITUTION, &c.	1710 & 1730. Climatology—Agricultural and Hygienic.	1180. Rainfall Tables.	1800. Meteorological Registers—General.	1810. Hourly Values.	1820. Daily Values.	1830. Daily Weather Reports.	1840. Weather Reports, other than Daily.	1870. Meteorological Charts.
e. **ASIA AND MALAY ARCHIPELAGO**—*cont.*								
ef. **British India: Himalaya, Burmah, Ceylon:—**								
Meteorological Office, India, (Calcutta).	—	1905	1905	—	1905	1905	1905	—
Allahabad, Meteorological Office	—	1904	1904	—	—	—	1904	—
Bangalore, Mysore Government Meteorological Department.	—	1904	—	—	1904	—	—	—
Calcutta, Meteorological Office, Bengal.	—	1904	1904	—	—	1905	1905	—
Ceylon, Royal Botanic Gardens	—	1903	—	—	—	—	—	—
Colombo, Surveyor General's Office.	—	—	1904	—	—	—	1904	—
Kodaikánal, Observatory ..	—	—	1904	—	—	—	—	—
Lahore, Meteorological Reporter to Government, Punjab.	—	—	—	—	—	—	1905	—
eq. **Malay Peninsula and Archipelago, Philippines, &c.:—**								
Royal Magnetical and Meteorological Observatory (Batavia).	—	1904	1904	1903	—	—	—	—
Philippine Weather Bureau, Manila Central Observatory.	—	—	1902	1903	1904	—	1904	—
Buitenzorg, Institut Botanique de l'Etat.	—	—	—	—	1902	—	—	—
Pnom-Penh (Cambodia), *Bureau Central Mét., Paris.*	—	—	1902	—	—	—	—	—
Singapore. *Army Medical Dep., London.*	—	—	1903	—	—	—	—	—
Singapore, Principal Civil Medical Officer, Straits Settlements.	—	—	—	—	1904	—	—	—
Taiping, State Surgeon's Office..	—	—	1904	—	—	—	—	—
et. **Asiatic Turkey, Arabia, Syria:—**								
Beyrout, Jerusalem, and other stations. *K. K. Central-Anstalt für Meteorologie, Vienna.*	—	—	1903	—	1903	—	—	—
Hebron. *Scottish Met. Soc., Edinburgh.*	—	—	1903	—	—	—	—	—
Le Krey (Syria) and other stations. *Bureau Central Mét., Paris.*	—	—	1902	—	1902	—	—	—
Scutari. *Army Medical Dep., London.*	—	—	1903	—	—	—	—	—
f. **AFRICA AND MADAGASCAR.**								
fa. **Mediterranean States: Morocco, Algiers, Tunis, Tripoli:—**								
Service Météorologique du Gouvernement Général de l'Algérie.	—	—	—	—	—	1905	—	—
Algeria and Tunis, Benghazi (Tripoli), Tangier. *Bureau Central Mét., Paris.*	—	—	1902	—	1902	—	—	—

GEOGRAPHICAL LIST—*continued.*

NAME OF INSTITUTION, &c.	1710 & 1730. Climatology—Agricultural and Hygienic.	1180. Rainfall Tables.	1800. Meteorological Registers—General.	1810. Hourly Values.	1820. Daily Values.	1830. Daily Weather Reports.	1840. Weather Reports, other than Daily.	1870. Meteorological Charts.
f. **AFRICA AND MADAGASCAR** —*cont.*								
fb. **North-east Africa: Egypt, Nile Valley to 10° N., Abyssinia:—**								
Survey Department, Cairo ..	—	1904	1902	1902	1904	1905	1905	—
Sanitary Department, Cairo ..	1905	—	—	—	1905	—	—	—
Egyptian Sudan. *Meteorological Office, London.*	—	—	1902	—	—	—	—	—
Khartoum. *Army Medical Dep., London.*	—	—	1903	—	—	—	—	—
Ismailia, Port Said, Suez, Harar (Abyssinia). *Bureau Central Mét., Paris.*	—	—	1902	—	1902	—	—	—
fc. **Sahara and the French Sudan, &c.:—**								
Timbuctu and other stations. *Bureau Central Mét., Paris.*	—	—	1902	—	1902	—	—	—
fd. **West Africa from Morocco to the Congo:—**								
Lagos, Government Gazette ..	—	—	1905	—	..	—	—	—
Sierra Leone Observatory ..	—	1903	—	—	—	—	—	—
Sierra Leone, Accra, Cape Coast, Kumasi. *Army Medical Dep., London.*	—	—	1903	—	—	—	—	—
Saint-Louis (Senegal), Port Novo (Dahomey), and other stations. *Bureau Central Mét., Paris.*	—	—	1902	—	1902	—	—	—
Congo State and Angola:—								
Libreville and other stations. *Bureau Central Mét., Paris.*	—	—	1902	—	1902	—	—	—
East Africa from the Southern border of *fb* to the Zambesi:—								
British East Africa .. } *Meteorological Office, London.*	—	—	1902	—	—	—	—	—
British Central Africa }	—	—	1902	—	—	—	—	—
Rhodesia .. .. }	—	—	1902	—	—	—	—	—
Uganda .. .. .. }	—	—	1902	—	—	—	—	—
German East Africa. *Deutsche Seewarte, Hamburg.*	—	—	—	1902	1902	—	—	—
Mombasa. *Army Medical Dep., London.*	—	—	1903	—	—	—	—	—
Nairobi, Agricultural Department.	—	—	1904	—	—	—	1905	—
Zomba, Scientific Department ..	—	1903	1903	—	1905	—	—	—
South Africa South of the Zambesi:—								
Meteorological Commission (Cape Town).	—	—	1904	1902	—	—	—	—
Transvaal Meteorological Department (Johannesburg).	—	1905	1904	—	—	1905	1905	—

GEOGRAPHICAL LIST—*continued.*

NAME OF INSTITUTION, &c.	1710 & 1730. Climatology—Agricultural and Hygienic.	1180. Rainfall Tables.	1800. Meteorological Registers—General.	1810. Hourly Values.	1820. Daily Values.	1830. Daily Weather Reports.	1840. Weather Reports,
f. **AFRICA AND MADAGASCAR** —*cont.*							
fg. **South Africa South of the Zambesi**—*cont.*							
Durban, Natal Observatory ..	—	1902	—	—	1904	—	—
Southern Rhodesia, &c. *Meteorological Office, London.*	—	—	1902	—	—	—	—
Fort Napier (Natal), Pretoria. *Army Medical Dep., London.*	—	—	1903	—	—	—	—
fh. **Madagascar and Comoro Group:—**							
Bureau Central Met., Paris ..	—	1902	1902	—	1902	—	—
fi. **Red Sea and Islands:—**							
K. Akademie der Wissenschaften, Vienna.	—	—	—	[1903]	[1903]	—	—
g. **NORTH AMERICA.**							
gb. **Canada as a whole:—**							
Meteorological Service, Dominion of Canada (Toronto).	—	—	—	—	—	1905	19(
Ottawa. Department of Marine and Fisheries.	—	—	1904	1903	—	—	—
gd. **Canadian Dominion East: Newfoundland:—**							
Toronto, Bureau of Industries ..	—	—	1904	—	—	—	—
ge. **The Laurentian Lakes:—**							
U.S. Weather Bureau, Department of Agriculture, Washington.	—	—	—	—	—	—	—
gf. **United States as a whole:—**							
U.S. Weather Bureau, Department of Agriculture, Washington.	—	—	1904	1903	1904	1905	19(
gg. **North-Eastern United States, East of Mississippi:—**							
Cambridge (Mass.), Astronomical Observatory of Harvard College.	—	—	—	—	1902	—	—
New York, Meteorological Observatory.	—	—	—	1905	—	—	—
Washington, United States Naval Observatory.	—	—	—	—	1902	—	—

GEOGRAPHICAL LIST—*continued*.

NAME OF INSTITUTION, &c.	1710 & 1730. Climatology - Agricultural and Hygienic.	1180. Rainfall Tables.	1800. Meteorological Registers—General.	1810. Hourly Values.	1830. Daily Values.	1830. Daily Weather Reports	1840. Weather Reports, other than Daily.	1870. Meteorological Charts.
9. NORTH AMERICA—*cont.*								
Western United States, West of Mississippi:—								
Colorado Springs, Colorado College Observatory.	—	—	—	—	1904	—	—	—
CENTRAL AND SOUTH AMERICA AND WEST INDIES.								
Mexico:—								
Leon, Observatorio Meteorológico.	—	—	—	—	1905	—	1905	—
Mexico, Dirección General de Telégrafos Federales.	—	—	—	—	—	1903	—	—
Oaxaca (A. M. Dominguez) ..	—	1903	—	—	—	—	—	—
Oaxaca, Observatorio Meteorológico.	—	—	—	—	1905	—	1905	—
Saltillo, Observatorio Meteorológico del Colegio de San Juan Nepomuceno.	—	—	—	—	1904	—	—	—
Tacubaya, Observatorio Astrónomico Nacional.	—	—	—	—	1896	—	—	—
British Honduras, &c.:—								
Belize, Public Hospital	—	—	—	—	1904	—	—	—
West Indian Islands, Caribbean Sea, Gulf of Mexico:—								
Antigua, Government Laboratory.	—	—	—	—	1905	—	—	—
Bahamas	—	—	—	—	1902	—	—	—
Barbados, St. Lucia, Jamaica, Bermuda. *Army Medical Dep., London.*	—	—	1903	—	—	—	—	—
Grenada, Richmond Hill Observatory.	—	1905	—	—	1905	—	—	—
Guadeloupe, Martinique and other stations. *Bureau Central Mét., Paris.*	—	—	1902	—	1902	—	—	—
Havana, Estación Central Meteorológica, Climatológica y de Cosechas.	—	—	—	—	—	—	1904	—
Havana, Observatorio del Colegio de Belen.	—	—	—	—	1904	—	—	—
Kingston, Government Laboratory.	—	1905	—	—	—	—	1905	—
Port-au-Prince, Haiti. *K. K. Central-Anstalt für Meteorologie, Vienna.*	—	—	1903	—	1903	—	—	—
St. Lucia, Botanic Gardens ..	—	—	1904	—	—	—	—	—
St. Lucia, Harbour Master ..	—	—	—	—	1905	—	—	—
St. Vincent, Botanic Gardens ..	—	—	1903	—	—	—	—	—
U.S. Weather Bureau, Washington.	—	—	—	—	—	—	1904	—
Guiana—British, Dutch, and French; Venezuela; Trinidad:—								
Cayenne and other stations. *Bureau Central Mét., Paris.*	—	—	1902	—	1902	—	—	—
Georgetown, Demerara, Botanic Gardens.	—	—	1904	—	1904	—	—	—
Paramaribo. *K. Nederlandsch Meteorologisch Instituut de Bilt.*	—	—	—	—	1903	—	—	—
Trinidad, Royal Botanic Gardens	—	1904	1904	—	—	—	—	—

GEOGRAPHICAL LIST—*continued.*

NAME OF INSTITUTION, &c	1710 & 1730. Climatology—Agricultural and Hygienic.	1180. Rainfall Tables.	1800. Meteorological Registers—General.	1810. Hourly Values.	1820. Daily Values.	1830. Daily Weather Reports.	1840. Weather Reports, other than Daily.	1870. Meteorological Charts.
h. **CENTRAL AND SOUTH AMERICA AND WEST INDIES**—*cont*								
hh. **Brazil**:—								
Ministerio de Marinha. Directoria de Meteorologia, Rio Janeiro.	—	—	1904	1904	1904	—	—	—
Cuyabá, Observatorio Meteorologico "D. Bosco."	—	—	1904	—	1904	—	—	—
Cuyabá (Revista Matto Grosso)	—	—	—	—	1905	—	—	—
Para. *K. K. Central-Anstalt für Meteorologie, Vienna.*	—	—	—	—	1903	—	—	—
Rio Janeiro, Observatorio ..	—	—	1903	—	1903	—	—	—
São Paulo, Commissão Geographica e Geologica, Servico Meteorologico.	—	—	1902	—	—	—	—	—
hi. **Argentina, Uruguay, and Paraguay**:—								
Oficina Meteorológica Argentina (Buenos Aires).	—	—	—	—	—	1905	—	—
Dirección General del Servicio Meteorológico Nacional, Monte Video.	—	1905	1905	—	—	—	—	—
Monte Video, Observatorio Meteorológico Municipal.	—	—	—	1904	1903	—	1904	—
Villa Colón, Observatorio Meteorológico.	—	—	—	1902	1902	—	1902	—
hk. **Chili**:—								
Servicio Meteorológico de la Direccion del Territorio Maritimo (Valparaiso.)	—	—	—	—	1903	—	—	—
Punta Arenas, Observatorio Meteorológico del Colegio Salesiano "S. José."	—	1902	—	1902	—	—	—	—
Santiago, Observatorio Astronómico.	—	—	1904	—	—	—	—	—
i. **AUSTRALASIA.**								
Sydney Observatory	—	—	—	—	—	1905	—	—
ia. **New Guinea**:—								
British New Guinea (Government Gazette).	—	—	1904	—	—	—	—	—
Kissidougou, Labé and Siarrhéa. *Bureau Central Mét., Paris.*	—	—	1902	—	—	—	—	—
id. **Queensland**:—								
Brisbane, Government Statistician's Office.	1904	—	—	—	—	—	—	—

GEOGRAPHICAL LIST—*continued.*

	NAME OF INSTITUTION, &c.	1710 & 1730. Climatology—Agricultural and Hygienic.	1180. Rainfall Tables.	1800. Meteorological Registers—General.	1810. Hourly Values.	1820. Daily Values.	1830. Daily Weather Reports.	1840. Weather Reports other than Daily.	1870. Meteorological Charts.
	i. **AUSTRALASIA**—*cont.*								
ie.	**New South Wales:—**								
	Sydney, Department of Public Instruction.	—	1902	1902	—	1902	—	—	—
	Windsor (John Tebbutt)	—	—	1903	—	—	—	—	—
ig.	**South Australia:—**								
	Adelaide Observatory	—	1903	1903	—	1903	—	—	—
ih.	**West Australia:—**								
	Perth Observatory	—	1905	1903	—	1903	—	1905	—
ik.	**New Zealand:—**								
	Wellington, Meteorological Department.	—	1903	1903	—	—	—	—	—
	Wellington, Government Observatory.	—	—	—	—	1904	—	—	—
il.	**New Caledonia, New Hebrides, and Loyalty Islands:—**								
	Noumea (N. Cal.). *Bureau Central Mét., Paris.*	—	—	1902	—	—	—	—	—
	k. **ARCTIC.**								
kb.	**Greenland:—**								
	Commission Danoise des Explorations Géographiques et Géologiques du Groenland (Copenhagen).	—	—	—	1899	—	—	—	—
kd.	**Islands north of Europe and Asia:—**								
	Norwegian North Polar Expedition [H. Mohn].	—	—	1896	1896	1896	—	—	—
	Spitzbergen (J. Westman) ..	—	—	—	1900	—	—	—	—
	l. **ATLANTIC.**								
la.	**North Atlantic Ocean:—**								
	Deutsche Seewarte, Hamburg ..	—	—	—	—	—	—	—	1905
	Hydrographic Office, Washington ..	—	—	—	—	—	—	—	1905
	Meteorological Office, London ..	—	—	—	—	—	—	—	1905
lb.	**Azores, Canaries, Madeira, Cape Verde:—**								
	Service Météorologique des Açores, Ponta Delgada.	—	—	1905	1905	—	—	—	—
	Observatorio Do Infante D. Luiz, Lisbon.	—	—	1900	—	—	—	—	—
	Teneriffe. Las Palmas. *Bureau Central Mét., Paris.*	—	—	1902	—	—	—	—	—

GEOGRAPHICAL LIST—*continued.*

NAME OF INSTITUTION, &c.	1710 & 1730. Climatology—Agricultural and Hygienic.	1180. Rainfall Tables.	1800. Meteorological Registers—General.	1810. Hourly Values.	1830. Daily Values.	1830. Daily Weather Reports.	1840. Weather Reports other than Daily.	1870. Meteorological Charts.
***m.* INDIAN OCEAN.**								
ma. **Ocean and Islands north of Equator:—**								
Meteorological Office, Calcutta ..	—	—	—	—	—	—	—	1905
mb. **Ocean and Islands south of Equator:—**								
Mauritius, Royal Alfred Observatory.	—	—	1904	1901	1901	—	—	—
Mauritius. *Army Medical Dep., London.*	—	—	1903	—	—	—	—	—
Réunion. *Bureau Central Mét., Paris.*	—	—	1902	—	—	—	—	—
***n.* PACIFIC.**								
na. **North Pacific Ocean north of Equator:—**								
Hydrographic Office, Washington ..	—	—	—	—	—	—	—	1905
nd, ne. **Pacific Islands North of Equator:—**								
Christmas Island. *Scottish Met. Soc., Edinburgh.*	—	—	1903	—	—	—	—	—
Honolulu (R. C. Lydecker) ..	—	—	—	—	1903	—	—	—
Marshall Islands. *Deutsche Seewarte, Hamburg.*	—	—	—	—	1899	—	—	—
nf, nh. **Pacific Islands South of Equator:—**								
Samoa and Cook Islands. *Deutsche Seewarte, Hamburg.*	—	—	—	—	1899	—	—	—
Tahiti, Rikitea (Mangareva). *Bureau Central Met., Paris.*	—	—	1902	—	—	—	—	—

LIST OF CURRENT METEOROLOGICAL PERIODICALS AND JOURNALS CONTAINING OCCASIONAL ARTICLES ON METEOROLOGICAL SUBJECTS RECEIVED FOR THE OFFICE LIBRARY.

Annales de l'Observatoire Municipal, Paris.
Annales du Bureau Central Météorologique de France.
Annalen der Hydrographie und maritimen Meteorologie.
Annali dell' Ufficio Centrale Meteorologico e Geodinamico Italiano.
Annuaire de la Société Météorologique de France.
Annuaire Météorologique de l'Observatoire Royal de Belgique.
Aus dem Archiv der Deutschen Seewarte.
Beiträge zur Physik der freien Atmosphäre.
Ciel et Terre.

Comptes rendus hebdomadaires des séances de l'Académie des Sciences, Paris.
Das Wetter.
Geographical Journal.
Globe (Le), Journal Géographique.
Himmel und Erde.
Indian Meteorological Memoirs.
Jahrbuch der Astronomie und Geophysik (H. J. Klein).
Journal of the Franklin Institute.
Journal of the Meteorological Society of Japan.
Journal of the Royal United Service Institution.
Journal of the Scottish Meteorological Society.
Journal of the Society of Arts.
London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science.
Memoirs and Proceedings of the Manchester Literary and Philosophical Society.
Meteorologische Zeitschrift.
Mitteilungen aus dem Gebiete des Seewesens, Pola.
Monthly Meteorological Bulletin of the Nicolas Central Physical Observatory.
Monthly Notices of the Royal Astronomical Society.
Nature.
Nature (Le).
Nautical Magazine.
Oversigt over det Kongelige danske Videnskabernes Selskab Forhandlinger.
Petermann's (Dr. A.) Mitteilungen aus Justus Perthes' Geographischer Anstalt.
Proceedings of the American Philosophical Society.
Proceedings of the Cambridge Philosophical Society.
Proceedings of the Royal Irish Academy.
Proceedings of the Royal Society of London.
Quarterly Journal of the Royal Meteorological Society.
Scientific Proceedings of the Royal Dublin Society.
Scottish Geographical Magazine.
Smithsonian Contributions to Knowledge.
Smithsonian Miscellaneous Collections.
Symons's Meteorological Magazine.
Tijdschrift van het Koninklijk Nederlandsch Aardrijkskundig Genootschap.

In addition to the works summarised in the above lists, a large number of books and pamphlets dealing with meteorological subjects have been received. Some of the more important are referred to on p. 41.

The compilation of a complete bibliography of meteorological literature is included in the objects of the International Catalogue of Scientific Literature, and the necessity for the publication in full of the titles of all books and pamphlets received at the office is thereby obviated. It is intended to deal with the matter in due course in connexion with the catalogue of the Library.

APPENDIX VIII.

LIST of INSTITUTIONS and PERSONS receiving PUBLICATIONS issued by the COMMITTEE.

OBSERVERS contributing returns printed in one of the periodical publications receive a copy of the publication.

The *Daily Weather Report* is sent to seaports and to a few places in London for exhibition.

The *Annual Report* is sent to all observers at land stations in connexion with the Office who express a wish to receive it. It is also sent to certain Professors at British Universities and Colleges, and to Agricultural Colleges.

Periodical or occasional publications are sent to the institutions and persons named in the following list, generally speaking, in exchange for publications received.

UNITED KINGDOM.

Public Offices:		Admiralty:—	
Edinburgh	Board of Fisheries.	Dartmouth	Royal Naval College.
	*Royal Scottish Museum.	Greenwich	*Royal Naval College.
	*Royal Observatory.		*Royal Observatory.
London ...	Army Medical Department.	London ...	Hydrographer.
			Librarian.
	Board of Agriculture (Dr. Somerville).	Portsmouth	Royal Naval College.
		R.N.R. Drill Ships	H.M.S. "Briton" (Inverness).
	*Board of Education, Secondary Branch.		„ "Clyde" (Aberdeen).
	—— Solar Physics Observatory.		„ "Daedalus" (Bristol).
	Board of Trade.		„ "Durham" (Leith).
	—— Superintendents of the M.M.O. at various seaports.		„ "Eagle" (Liverpool).
			„ "President" (W. I. Dock)
	—— Consultative Branch.		„ "Unicorn" (Dundee).
	—— Fisheries and Harbour Department.		
	—— Marine Department (Capt. Chalmers).		
	—— Standard Weights and Measures Department.		
	Chinese Maritime Customs.		
	General Post Office		
	*Imperial Institute.		
	Registrar General.		
	Trinity House.		

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* Receive all publications (Daily Weather Report and Monthly Marine Charts not necessarily included).

LIST OF INSTITUTIONS, &c., receiving PUBLICATIONS—*cont.*

UNITED KINGDOM—*cont.*

Aberdeen ...	Observatory.
Alnwick ...	Duke of Northumberland.
Armagh ...	Observatory.
Barry ...	Board of Trade Surveyor.
Bexley Heath	Kettle, W. R.
Bidston ...	*Liverpool Observatory.
Birkenhead ...	"Conway" Training Ship.
Birmingham ...	Central Free Library.
	University.
Birr	Earl of Rosse.
Cambridge ...	Darwin, Sir G. H.
	Observatory.
Cardiff ...	University College.
Dublin ...	Moore, Sir J. W.
	*Royal Dublin Society.
	*Royal Irish Academy.
	Stoney, B.
Dundee ...	Brown, C. H. (Agent).
Durham ...	Observatory.
Eastham ...	Babington, T. H.
Edinburgh ...	Buchan, A.
	Royal Scottish Geographical Society.
	*Royal Society.
	*Scottish Meteorological Society.
	*University Library.
Falmouth ...	Observatory.
	Royal Cornwall Polytechnic Society.
Glasgow ...	"Nautical Magazine."
	Observatory.
Greenhithe ...	"Worcester" Training Ship.
Hull	Shipmasters' Association.
Jersey ...	St. Louis Observatory.
Leith... ...	Nautical College.
Liverpool ...	*Free Public Library.
	Fry, Capt.
	Mercantile Marine Service Association.
	Nautical College.
	Richardson, Spence & Co.
	Underwriters' Rooms.
London ...	Archibald, E. D.
	Eastern Telegraph Co.
	Galton, F.
	*Guildhall Library.
	*Institution of Civil Engineers.
	*Lloyd's.
	*London Institution.
	*Mill, H. R.
	"Nature."
	Navigation School.
	Royal Astronomical Society.

UNITED KINGDOM—*cont.*

London—*cont.*	Royal Geographical Society.
	*Royal Institution of Great Britain.
	*Royal Meteorological Society.
	Royal National Lifeboat Institution.
	*Royal Society.
	*Royal United Service Institution.
	Sailors' Palace.
	Scott, R. H.
	"Shipping Gazette."
	Society of Arts.
	Strachan, R.
	Toynbee, Capt. H.
Manchester ...	*Philosophical Society.
Markree ...	Observatory.
Northampton.	Markham, C. A.
Oxford ...	Clifton, Prof. R. B.
	*Radcliffe Observatory.
	School of Geography.
Oxshott ...	Dines, W. H.
Pewsey(Wilts.)	Dixon, H. P.
Plymouth ...	Incorporated Chamber of Commerce.
	Marine Biological Laboratory.
Portland ...	Seamen's Reading Room.
Richmond (Surrey)	National Physical Laboratory.
Rugby ...	Natural History Society.
Southampton.	Forbes, Capt. (Agent).
	Ordnance Survey Office.
Southport ...	Fernley Observatory.
South Shields	Marine Schools.
Stonyhurst ...	Observatory.
Valencia ...	Observatory.
Wokingham...	Simmonds, G. H.
Yarmouth ...	Sailors' Home.
York	Philosophical Society.

BRITISH COLONIES AND DEPENDENCIES.

Australasia.

Adelaide ...	*Government Astronomer.
Brisbane ...	Government Meteorologist.
	*Public Library.
Hobart ...	Royal Society of Tasmania.
Melbourne ...	*Observatory.
Perth ...	Meteorological Reporter.

* Receive all publications (Daily Weather Report and Monthly Marine Charts not necessarily included).

List of Institutions, &c., receiving Publications—*cont.*

British Colonies and Dependencies—*cont.*

Australasia—cont.

Sydney ...	*Observatory.
	Royal Society of New South Wales.
Wellington ...	*Colonial Museum.
Windsor ...	Observatory.

Canada.

Montreal ...	McGill University.
Toronto ...	*Meteorological Office.

Falkland Islands.

Cape Pembroke	Lighthouse Keeper.

India and Eastern Asia.

Allahabad ...	Meteorological Reporter.
Bangalore ...	Meteorological Department.
Bombay ...	Observatory.
Calcutta ...	*Meteorological Reporter. (Alipore.)
	Surveyor General.
Dehra Dun ...	Trigonometrical Survey
Hong Kong ...	*Observatory.
Kodaikanal ...	Observatory.
Simla ...	Meteorological Reporter.
Singapore ...	Principal Civil Medical Officer.

Mediterranean.

Malta ...	Observatory.

South Africa.

Bloemfontein.	Grey College.
Cape Town ...	Observatory.
	Meteorological Commission.
Durban ...	Natal Observatory.
Johannesburg	Transvaal Meteorological Department.

Indian Ocean.

Mauritius ...	*Meteorological Society.

Europe.

Austria-Hungary.

Cracow ...	Observatory.
Fiume ...	Nautical Academy.
Innsbrück ...	Observatory.
O'Gyalla ...	Observatory.
Pesth... ...	*Central Meteorological Institute.
Pola	*Hydrographic Office.

Europe—*cont.*

Austria-Hungary—*cont.*

Prague ...	Hydrographic Office.
	*Observatory.
	Royal Society of Sciences.
Trieste ...	Observatory.
Vienna ...	Austrian Meteorological Society.
	Central Hydrographical Bureau.
	*Central Meteorological Office.
	*Hann, Hofrath Dr. J.
	Ministry of Agriculture.

Belgium.

Brussels (Uccle)	*Observatory.
	Meteorological Service.
Ostend ...	Navigation School.

Bulgaria.

Sofia	Central Meteorological Station.

Denmark.

Copenhagen ...	Hydrographic Office.
	International Council for the Study of the Sea.
	*Meteorological Institute.
	*Society of Sciences.

France.

Bordeaux ...	Society of Oceanography of the Gulf of Gascony.
Lyons ...	Observatory.
Marseilles ...	Meteorological Commission.
Paris	*Central Meteorological Office.
	*Hydrographic Office. Hydrometric Service.
	*Institute of France.
	*Meteorological Society.
Perpignan ...	Meteorological Commission.
Puy-de-Dôme.	Observatory.

Germany.

Aachen ...	Meteorological Station.
Berlin ...	Hydrographic Office.
	*Meteorological Institute.
	Wetterbureau.

* Receive all publications (Daily Weather Report and Monthly Marine Charts not necessarily included).

List of Institutions, &c., receiving Publications—*cont.*

Germany—*continued.*	
Bremen ...	Meteorological Observatory.
Carlsruhe ...	Central Meteorological Office.
Darmstadt ...	Hydrographical Bureau.
Dresden ...	*Meteorological Institute.
Frankfort ...	Physical Society.
Gotha ...	M. Justus Perthes' Geographical Institute.
Greifswald ...	Geographical Society.
Halle ...	Leopold-Carolin Academy.
Hamburg ...	*Deutsche Seewarte.
	Schück, Capt. A.
Kiel ...	Commission for the Exploration of the German Ocean.
Leipzig ...	University Library.
Lindenberg ...	Royal Prussian Aeronautical Observatory.
Magdeburg ...	Observatory.
Munich ...	*Central Meteorological Office.
	Observatory.
Neustadt ...	Forest Academy.
Neustadt an der Haardt.	Wirkl. Geh. Rath Dr. G. von Neumayer.
Potsdam ...	*Observatory.
Strassburg ...	Meteorological Agricultural Service.
Stuttgart ...	Central Meteorological Office.
Wilhelmshaven.	Observatory.
Greece.	
Athens ...	Observatory.
Italy.	
Catania ...	Meteorological Observatory.
Florence ...	Observatory.
Messina ...	Observatory.
Milan ...	Observatory.
Moncalieri ...	*Observatory.
Naples ...	*Observatory.
Palermo ...	Observatory.
Pesaro ...	Observatory.
Riposto ...	Observatory.
Rome ...	Central Meteorological Office.
	Vatican Observatory.
Turin ...	*Observatory.
Venice ...	Observatory.
Netherlands.	
Amsterdam ...	*Geographical Society.
	Meteorological Institute.
De Bilt, Utrecht.	*Royal Meteorological Institute.
Norway.	
Christiania ...	*Meteorological Institute.
Portugal	
Coimbra ...	Observatory.
Lisbon ...	Observatory.
Azores.	
Ponta Delgada	Observatory.
Roumania.	
Bucharest ...	Meteorological Institute.
Russia.	
Dorpat ...	Observatory.
Helsingfors ...	Society of Sciences.
Kazan ...	Observatory.
Koutchino ...	Aerodynamical Institute.
Moscow ...	Observatory.
Nicolaieff ...	Hydrographic Office.
Odessa ...	Observatory.
Pavlovsk ...	Observatory.
St. Petersburg	*Central Physical Observatory.
	Hydrographic Department.
	Woeikof, A.
Tiflis	*Observatory.
Warsaw ...	Meteorological Bureau.
Servia.	
Belgrade ...	Central Observatory.
Spain.	
Guardia ...	Observatory.
Madrid ...	Central Meteorological Institute.
	*Observatory.
	Observatory, Chamartin de la Rosa.
Malaga ...	Society of Sciences.
San Fernando	*Observatory.
Tortosa ...	Ebro Observatory.
Vilafranca del Panades.	Observatory.

* Receive all publications (Daily Weather Report and Monthly Marine Charts not necessarily included).

[illegible] PUBLICATIONS—*cont.*

[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]
		[illegible]	[illegible]

APPENDIX IX.

T of RECEIPTS and PAYMENTS for the year ended 31st March, 1906 :—

RECEIPTS.	£ s. d.	£ s. d.	PAYMENTS.	£ s. d.	£ s. d.
ım year 1904-	—	1,010 4 9	ADMINISTRATION: Committee (Travelling)	41 8 0	
ary vote ..	—	15,300 0 0	Director	1,000 0 0	1,041 8 0
for forms, instruments, &c. ..	—	53 9 10	Salaries and wages ..	1,108 19 0	
			Rent, fuel, and lighting	719 7 4	
			Incidental and contingent expenses	324 17 5	
			Furniture, fittings, &c. ..	73 13 10	
RESEARCHES ..	—	3 8 0	Expenses incidental to International Meteorological Congress ..	20 11 9	2,247 9 4
F INFORMA-			SPECIAL RESEARCHES: Salaries and other charges	—	3:3 11 10
Forecasts, Re-	630 19 1		LAND METEOROLOGY: Observatories and stations, including remuneration of observers, &c.	2,089 3 1	
s sent abroad	457 19 3	1,088 18 4	Salaries:— Discussion and reduction of observations, &c.	1,955 13 9	4,044 16 10
INSTRUMENTS,					
nt of cost of of instruments l Navy.. ..	701 7 10		WEATHER INFORMATION AND FORECASTS: Telegraphic reports and storm warnings, remuneration of observers, &c.	2,463 19 9	
nt of cost of ments by Governments, ra, &c.	890 16 7		Salaries: — Preparation and issue of reports and forecasts	1,402 5 7	3,866 5 4
r Commission	28 13 2	1,620 17 7			
METEORO-	—	300 0 0	INSPECTIONS: Salaries and travelling expenses	—	402 13 2
VATION AC-			OCEAN METEOROLOGY: Salaries:—Discussion and reduction of observations	1,703 0 3	
.. .. ..	285 0 0		Agents' fees, &c.	117 0 2	1,820 0 5
n Investment	53 4 7				
t of Income	7 13 3	345 17 10	INSTRUMENTS: Royal Navy	601 7 10	
			Do. Proportion of salaries ..	100 0 0	
			Mercantile Marine, Stations, Colonial Governments, &c.	1,281 19 2	
			Do. Proportion of salaries .	246 0 0	2,229 7 0
			ANTARCTIC METEOROLOGY:— Salaries and other charges	—	236 9 2
			SUPERANNUATION: Pensions and Allowances	—	829 0 0
			BALANCE: Cash at Bank	2,578 16 8	
			„ at Office	42 18 7	2,621 15 3
		£19,722 16 4			£19,722 16 4

March 31st the amount of 2½ per cent Annuities held for the provision of Superannuation s £2,156 4s. 1d.

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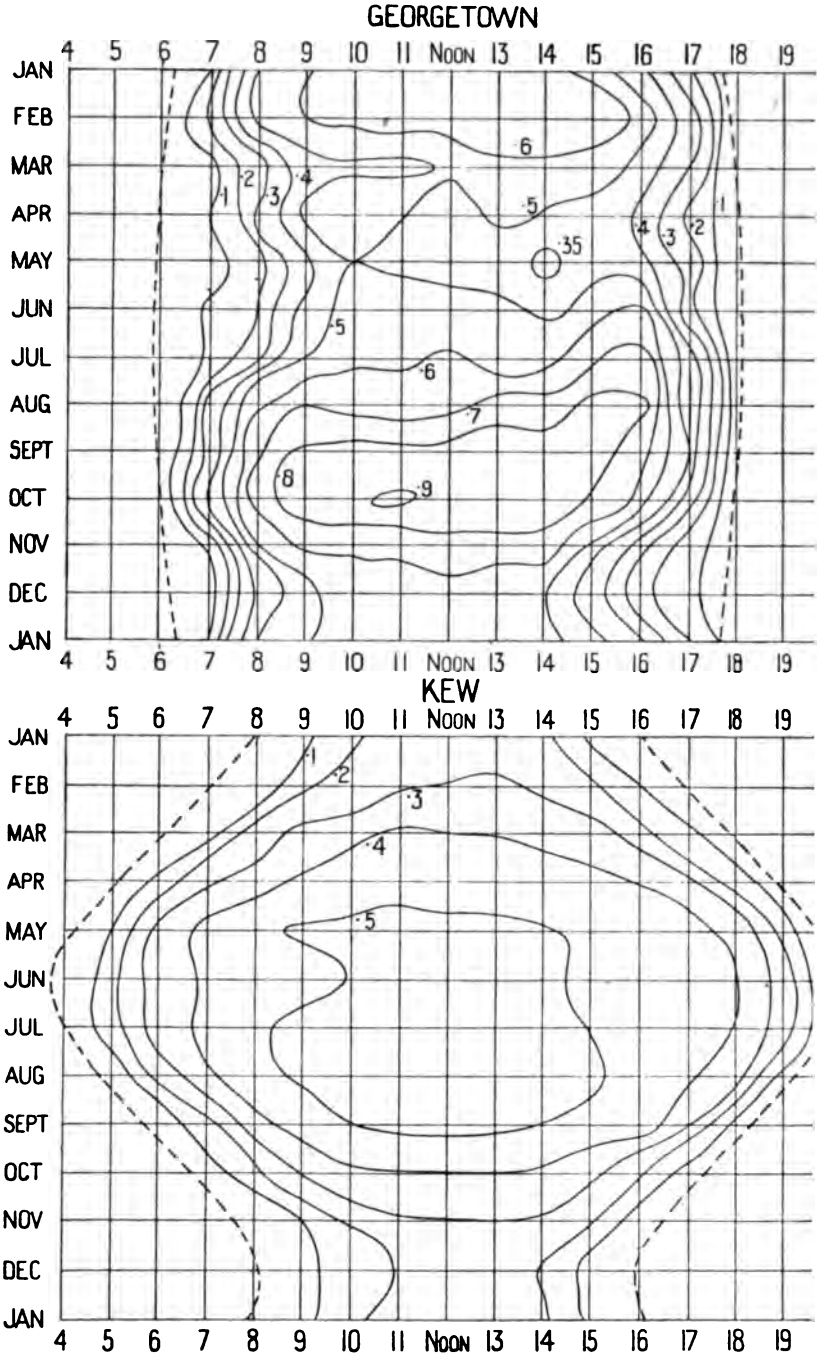
Plate 1.—*Frontispiece to the 5th Report of the Meteorological Committee.*

SUNSHINE RECORDS AT GEORGETOWN, BRITISH GUIANA, LAT. 6°. 49′. AND AT KEW OBSERVATORY, RICHMOND, SURREY, LAT. 51°. 28′. N.

Lines showing the fractional portion, in tenths of each hour of the day in the several the year, which is sunny, according to the Averages of the Records for 3 *years* | *at Georgetown, and for* 25 *years* [1881–1905] *at Kew. Broken lines are draw diagram to indicate approximately the times of Sunrise and Sunset.*



16467

FIFTH ANNUAL REPORT

OF THE

METEOROLOGICAL COMMITTEE

TO THE

LORDS COMMISSIONERS OF HIS MAJESTY'S TREASURY.

For the Year ended 31st March, 1910.

Presented to both Houses of Parliament by Command of His Majesty.

LONDON:
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BY DARLING & SON, LTD., 34-40, BACON STREET, E.

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1910.

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M. Gr. Pacs.
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THE METEOROLOGICAL COMMITTEE, 1909-10,

Constituted by Minute of the Lords Commissioners of H.M. Treasury, dated 20th May, 1905.

Date of Appointment.	
April 1, 1905	... Mr. W. N. SHAW, Sc.D., F.R.S., Director, *Chairman.*
„ „	... Rear-Admiral ARTHUR MOSTYN FIELD, R.N., F.R.S., Hydrographer to the Navy, till 2nd September, 1909.
Sept. 3, 1909	... Rear-Admiral H. E. PUREY CUST, R.N., Hydrographer to the Navy.
April 1, 1905	... Captain A. J. G. CHALMERS, Professional Member of the Marine Department, Board of Trade. Nominated by the Board of Trade.
„ „	... Sir GEORGE H. DARWIN, K.C.B., F.R.S., University of Cambridge. Nominated by the Royal Society.
„ „	... Professor ARTHUR SCHUSTER, F.R.S., University of Manchester. Nominated by the Royal Society.
„ „	... Mr. G. L. BARSTOW. Nominated by the Treasury.
Dec. 3, 1906	... Professor T. H. MIDDLETON, M.A., M.Sc., Assistant Secretary of the Board of Agriculture and Fisheries. Nominated by the Board of Agriculture.

Subject to the discretion of the authorities by which they were respectively nominated, the members of the Committee hold office for a period not exceeding five years, but are eligible for reappointment.

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METEOROLOGICAL OFFICE STAFF
1909-10.

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William Napier Shaw, LL.D., Sc.D., F.R.S.

MARINE BRANCH.

Marine Superintendent ... M. W. Campbell Hepworth, C.B., I
Commander, R.N.R.
Principal Assistant ... C. Harding.
Nautical Assistant ... W. Allingham.

FORECAST BRANCH.

Principal Assistant ... F. J. Brodie.
Forecast Assistants ... H. Harries, R. Sargeant.

STATISTICS AND LIBRARY BRANCH.

Superintendent ... ... R. G. K. Lempfert, M.A.
Principal Assistant ... T. Duncan Bell.

INSTRUMENTS BRANCH.

Superintendent ... ... R. H. Curtis.
Assistants ... ... J. Sheerman, R. F. Wallace.

CORRESPONDENCE AND ACCOUNTS.

Chief Clerk and Cashier... John A. Curtis.

Clerks ... ... W. G. James, A. J. Rigby, and (
Thompson; A. H. Bell, C
Bracey, E. J. Hood, L. H. Pc
A. R. Simpkins, F. W. Snell
J. T. Williams; E. L. Ardley,
Bench, C. E. P. Brooks, W. H
C. W. Heinemann, A. G. W. Ho
J. H. James, H. Keeton, and H.
Tarrant; A. E. Pycock.
Misses E. D. Anderson, D. Bucke
E. C. Humphreys, R. E. Smitl
A. Turney.

---

2 Office Keepers, 5 Boy Clerks and Probationers, 2 Messe
3 Boy Messengers.

Special Assistant to the Director ... R. Corless, B.A.
Director of Experiments in Connexion with the Investigation of the Upper Air ... ... W. H. Dines, B.A., F
Pyrton Hill, Oxon.
Valencia Observatory: Superintendent J. E. Cullum.
Assistant ... J. Sugrue.
Additional Inspectors .. .. A. Watt, M.A., Sec
Scottish Meteorol
Society; T. W. I
Kew Observatory;
Constable, Kew (
vatory

FIFTH ANNUAL REPORT

OF THE

METEOROLOGICAL COMMITTEE

TO

THE LORDS COMMISSIONERS OF HIS MAJESTY'S TREASURY,

For the Year ended 31st of March, 1910—the Fifty-fifth year of the Meteorological Office.

MAY IT PLEASE YOUR LORDSHIPS,

During the past year meetings of the Committee have been held on 5th May, 14th July, 3rd November, 1st December, 15th December, 1909, 2nd February and 2nd March, 1910. The business of the year has been exceptionally important. Negotiations with the Royal Society respecting the relations between the Office and Kew Observatory hitherto controlled by the National Physical Laboratory have been brought to a satisfactory issue. The fitting and furnishing of the new premises at South Kensington, which include provision for a museum and an adequate library, have claimed much attention. Important changes have been made in some of the periodical publications of the Office. The year under review is the concluding year of the period of five years for which the Director and Committee were appointed in 1905 and the provision made for the current year takes account of the prospects of the Office in the ensuing five years.

Upon the expiration of the term of office of Rear-Admiral A. M. Field, F.R.S., Hydrographer of the Navy, Captain H. E. Purey Cust, R.N. (his successor), was appointed a member of the Committee by Treasury Minute dated 3rd September, 1909.

Office Staff.—No important changes have taken place in the Office Staff during the year. It numbers 52, exclusive of those whose services are retained by the Committee for work of various kinds at observatories and stations. Steps have been taken to make some provision, by endowment assurance or otherwise, for retiring allowances or their equivalent in the case of women clerks and the office keepers and supernumerary clerks who are not included in the scheme of superannuation for classified clerks adopted by the Meteorological Council in 1900.

Publications.—The official publications issued or signed for press during the year by authority of the Committee are as follows :—

PERIODICAL.—The Daily Weather Report.

Monthly Meteorological Charts of the Atlantic Ocean and the Mediterranean.

Monthly Meteorological Charts of the Indian Ocean and the Red Sea.

The British Meteorological Year Book for 1909, comprising :—

Part I.—The Weekly Weather Report with Quarterly and Annual Appendices and two Special Appendices giving supplementary results of the investigation of the upper air in the British Isles during the year.

Part II.—The Monthly Weather Report with a summary for the year.

Part III.—Daily Observations at Stations of the Second Order and at Anemograph Stations.

Part IV.—Hourly Readings of pressure, temperature, humidity, rainfall, and sunshine at four normal Observatories (Aberdeen, Falmouth, Kew, and Valencia) in connexion with the Meteorological Office.

Observations at Stations of the Second Order. Annual Volume for 1906.

The Observer's Handbook. 1909 Edition.

OCCASIONAL.—Barometer Manual for the use of Seamen. 6th Edition.

Codex of Resolutions at International Conferences from 1872 to 1907. Compiled by H. Hildebrandsson, Upsala, and G. Hellmann, Berlin. English Edition.

The Free Atmosphere in the region of the British Isles. Contributions to the investigation of the upper air, comprising a Report by W. H. Dines, F.R.S., on apparatus and methods in use at Pyrton Hill, with an introduction and a note on the perturbations of the stratosphere by W. N. Shaw, Sc.D., F.R.S., Director of the Meteorological Office.

Other publications for which authority has been given and which are in preparation, but have not yet been issued, are as follows :—

Annual Volume of Observations at Stations of the Second Order for the year 1907. (In the press.)

The Trade Winds of the Atlantic Ocean. Contributions to the Study of the North-East and South-East Trade Winds, comprising a comparison of the changes in the temperature of the water of the North Atlantic and in the strength of the Trade Winds, by M. W. Campbell Hepworth, C.B., Commander, R.N.R., Marine Superintendent ; Climatological Tables for St. Helena, with a Report upon the Records of the Robinson anemograph from 1892 to 1907, by John Somers Dines, B.A. ; and Note on the connexion between the periodic variations of wind-velocity and of atmospheric pressure, by Ernest Gold, M.A., Schuster Reader in Meteorology. (In the press.)

Monthly Outline Sheets for charting tracks and noon values from Meteorological Logs. (In the press.)

Climatological Report for certain British Stations overseas.

The Computer's Handbook.

The Seaman's Handbook.

Gales on the British Coasts. A revised edition of the Fishery Barometer Manual.

The Seasons in the British Isles.

Normals for the four Observatories, and tables for their application in climatology.

Atlas of Tropical Hurricanes.

The periodical Publications : The Daily Weather Report.—The only change made in the course of the year apart from those incidental to the Radio-telegraphic service, which will be referred to later, consisted in the addition of a daily telegraphic report from Funchal, Madeira, through the instrumentality of Dr. Michael Grabham. It has been the wish of the committee for some years to supplement the information already received by reports from Madeira, the Canaries and Cape Verde Islands, so that the observations taken in conjunction with those from the Azores and from Atlantic liners may give a clear indication of the variations in position and intensity of the permanent high pressure area of the Atlantic and the consequent variations of the North East Trade Wind. Considerations of expense have hitherto prevented the realisation of this object, but through the good offices of Dr. Grabham an opportunity was offered for obtaining reports from Madeira on very favourable terms, and a commencement has now been made. Further negotiation is necessary in order to obtain the transmission of the report sufficiently early for it to be included in the current Daily Weather Report.

In preparation for the new year arrangement has been made to supplement the ordinary forecasts for 24 hours by a remark on the "**further outlook,**" when the meteorological conditions are regarded as justifying the addition. It has long been recognised that the fixing of a definite period of 24 hours as that for which a forecast could always be made was somewhat arbitrary. There are some occasions where it is felt to be too long and others where it is certainly unnecessarily short, yet no distinction was drawn between these different occasions. The revised arrangement affords to the official in charge an opportunity of indicating the differences of these different occasions, while keeping within the official rule that every forecast must be accompanied by the data employed and the reasons for the conclusion. The "general inference" which precedes the forecasts is intended to convey the reasons for the forecast, and when they are judged to be applicable to a larger period than 24 hours the remark in the column for the further outlook gives the application.

Trial was given to the plan during the summer of 1909 in a scheme initiated in conjunction with the Board of Agriculture for the supply of weather information by telegraph to the representative of the Board at a series of Agricultural Shows in various parts of the country, and in extension of the scheme for notifying the probability of a spell of fine weather during the harvest season which has been in operation for two years. It was decided to begin the regular issue of the further outlook on April 1st, the commencement of the new year; and, as the change involved an alteration in the size and plan of the forms used, notice was given beforehand to newspapers and other recipients of the forms; public attention was thereby directed to the change.

It may be noted in connexion with the service for the Agricultural Shows that the daily information and forecasts were supplemented by notes on the weather of the week in which the show was being held, derived from an examination of the records of the corresponding week in the past 30 years, and on the weather of the past week as given in the latest issue of the weekly report.

Daily Weather Service: Reports by Radio-Telegraphy from the Ship of H.M. Navy and from Atlantic Liners.—Reports of observation at 7 a.m. or 6 p.m. have been transmitted by radio-telegraphy whenever there was opportunity, from the ships of H.M. Navy in accordance with orders from the Lords Commissioners of the Admiralty. These reports are much valued; they are placed on the working charts with the same confidence in their accuracy as those from land stations. When the service was started a number of the readings of pressure, which are vital for the chart, seemed doubtful but a copy of every message has been sent to the Hydrographe with notes upon any doubtful readings, to be forwarded by him to the ships for inquiry, and returned with comments. The result i in the highest degree satisfactory, and the special thanks of the Committee are due to Their Lordships and to the Hydrographer, no only for the additions to the data used in compiling the charts, bu also for the opportunity of ascertaining the degree of accurac which may fairly be aimed at in observations at sea in ou latitudes.

The experiment in the transmission of reports by radio telegraphy from British and German Atlantic liners which wa begun in January, 1909, in conjunction with the Deutsch Seewarte, was continued till the end of April. It was resumed a a joint experiment by the two offices during the months of Augus and September with revised instructions and a more limited rang of time and area for the transmission of the messages. The are from which messages were received within two hours and 24 hour respectively are shown in the map of telegraphic reporting station Plate X. At the close of the second experimental period th Deutsche Seewarte decided to discontinue the transmission o messages from German ships, and sent a letter of cordial thanks t the office for its co-operation in the experiment.

Through the courtesy of the Marconi Company, the Shippin Companies and their Officers, the messages from British ships wer continued throughout the interval between the two experimenta periods, and afterwards, on the same favourable terms as wer arranged for the joint experiments. Upon the transfer of th shore stations to the Post Office the Postmaster-General, wit Your Lordships' authority, arranged to co-operate with the Marcon Company in continuing the service on the same terms, subject t reconsideration "should the meteorological traffic be found in th future to interfere with the ordinary work of the coast stations."

Reports have been received in the course of the year from th liners mentioned in the list given in Appendix IV, and have bee duly recorded in the Daily Weather Report and plotted on th working charts of the office. They are irregularly distributed through the week and over the steamer tracks, but there has bee little overlapping of observations. The reports cover barometer wind and weather. There is still some difficulty about th barometer readings; those from nearly adjacent areas are sometime irreconcilable. Many of the ships are still unprovided with mercur barometers, and in some instances the readings of an aneroid ar given even where a mercury barometer is available. There is n test of the accuracy of a group of barometer readings so searchin

as the plotting of the observations on a chart. It is greatly to be wished that neighbouring ships would exchange reduced barometer readings with each other. There are quite a considerable number of occasions upon which an effective and useful chart of the distribution of pressure over the mid-Atlantic could be made from simultaneous observations of ships within reach of one another, and a weather chart constructed on board would be an interesting addition to the daily newspaper of a liner. The exchange of readings would enable the ships' officers to notice discrepancies which cannot be effectively dealt with on shore. In the meantime every effort is made to account for, or to avoid, the appearance of doubtful barometric readings. To identify errors in transmission, a carbon duplicate of the observations is sent to the office and compared with the messages received. It is returned to the observing ship with inquiries about any doubtful readings. After further experience it may fairly be expected that the same standard of accuracy will be reached as in the wireless messages from the Navy. The corrections required for a barometer reading before it is ready for transmission are numerous and somewhat intricate, and in ordinary circumstances a marine observer is not required to make them; it is therefore not to be wondered at that practice is required to bring the observations to the standard necessary to meet the test of plotting on a synoptic chart. The new daily charts of the Atlantic, referred to later, will be found interesting from this point of view.

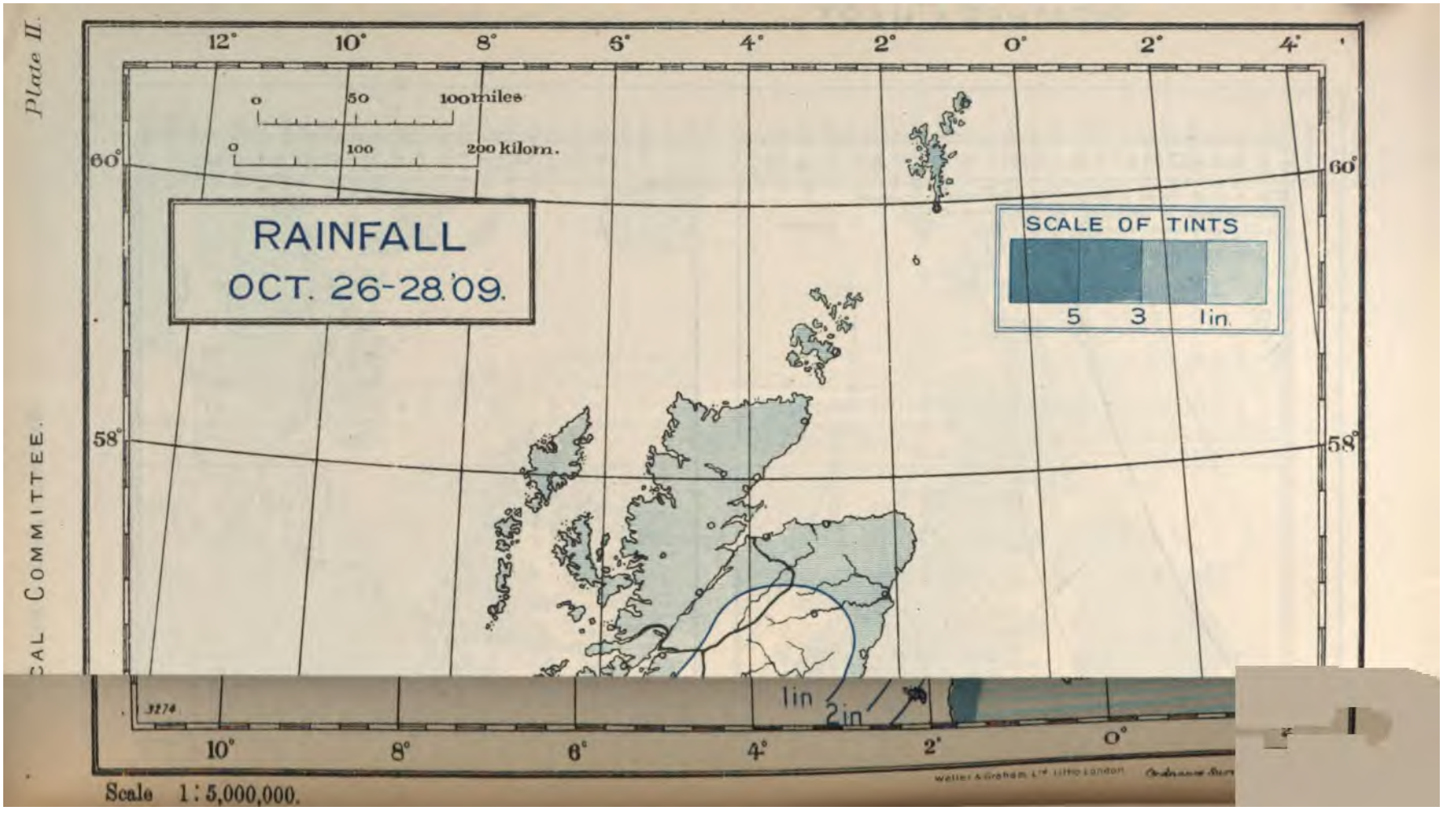
The accuracy of transmission in later months is not quite so striking as in the earlier period, but it is still excellent.

Monthly Meteorological Charts of the Atlantic.—In preparation for the year 1910-11, the Committee have made provision for a revised scheme of issue of the Atlantic charts. Rapid transit across the Atlantic has now become so well established that a number of vessels complete the passage across the ocean within a week, and the month is, from the practical point of view, too long an interval for the effective distribution of recent information. The average values, for the month, of pressure, wind, etc., which form the groundwork of the chart, are sufficiently applicable, but the information as to ice and surface temperature, which it has been customary to revise up to the date of issue, is practically out of date before a month has expired. The Committee had also in mind that some step ought to be taken to show the relations between the observations received from the Atlantic by radio-telegraphy or by cable from Madeira, Ponta Delgada, etc., and those received from shore stations, beyond what is at present practicable with the Daily Weather Report. The daily report goes to the lithographer within four hours of the time of observation, and many of the wireless messages and some of the land messages come in after the report has gone to press, so that the daily representation is incomplete in some important features. These various objects are now to be met by a weekly issue of the charts for the Atlantic based upon the same monthly averages, but revised week by week as regards recent information about ice, sea temperature, etc., and with a daily chart of pressure, wind, and as far as possible of temperature and weather over the whole region extending from the

Ural Mountains to the Rocky Mountains between the 67th and 23rd parallels of north latitude. The weekly issue takes place on Thursday direct to the outgoing liners, and on it the daily charts are brought up to that for the day before issuing. They include all the information collected in various ways by telegram at the office, and are amplified by information published in the Bulletin International of the Bureau Central Météorologique of France. The issue was arranged to begin with the chart for the month of May on April 14th, and the charts for the first two weeks were of remarkable interest, those for the second showing the conditions which caused great injury to the cotton crop of the United States. Apart from its immediate practical interest, the weekly issue promises to be of considerable value to the forecast branch of the office by giving a synopsis of the conditions over a very large area supplementary to that for the more limited region of the daily report, while the data for sea temperature and the positions of ice, which are arranged for weeks, enable the student to follow the gradual changes in the conditions of these elements over the Atlantic in direct relation with the corresponding changes on our own shores, as the periods are adjusted to correspond.

Reports of Polar Ice from Iceland.—The Danish Meteorological Office has arranged for telegrams transmitting reports received from ships as to the state of the polar ice in the neighbourhood of Iceland to be transmitted by cable from Iceland to Copenhagen. They are to be forwarded to us from there by post, or by arrangement they could be sent by telegram from Iceland direct. A number have already been received, and they form a useful addition to the information shown on the weekly temperature charts of the Atlantic. No arrangement has yet been made for their direct transmission by cable.

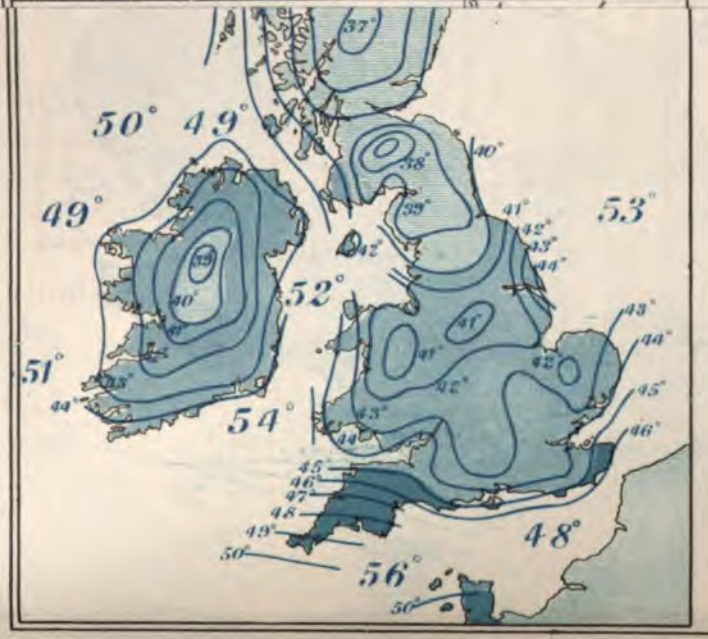
Monthly Meteorological Charts of the Indian Ocean.—The end of the year now under report gave occasion also for making a new departure as regards the charts of the Indian Ocean. The discussion of the data contained in the meteorological logs belonging to the Office for the Indian Ocean down to 30° S., which has been in progress since 1904, has been completed. The area most recently discussed, namely, that between 10° S. and 30° S., fills the blank between the southern boundary of the *Monthly Charts of the Indian Ocean*, and the northern boundary of official publication No. 123, *Charts of the Southern Ocean from the Cape to New Zealand*, a new edition of which was recently issued. The Office is now, accordingly, in a position to give the monthly data for the whole of the Indian Ocean and the part of the Southern Ocean within the corresponding longitudes. It has been thought best to issue these newly-completed results, which constitute an important addition to our knowledge of ocean meteorology, by extending the Indian Ocean Charts to include them, in preference to making a separate publication of the new portion or of the whole Indian Ocean to 30° S. For the time being it has been arranged to do this by enlarging the Monthly Charts without altering the scale of the map, but before the commencement of another year it is intended to take into consideration the range and scale of the chart. It is hoped in this connexion to realise a suggestion made by Mr. H. A.



Scale 1 : 5,000,000.

WEATHER CHART FOR THE WEEK ENDED OCT. 30. 1909.

1. BAROMETER AND WIND AT 7 A.M.



2. MOVEMENTS OF DEPRESSIONS.

COMMITTEE.

Plate III.

Weller & Graham, Ltd. Litho. London

Hunt, Director of the Commonwealth Weather Bureau of Australia, hen he visited London in 1908, that there should be organised o-operation between the Bureau and the Office as regards work of ommon interest in marine meteorology.

British Meteorological Year Book.—The year book for 1909 was ompleted and the collected parts ready for binding in a single olume by March 22, 1910. The committee wish to notify to Your ordships their appreciation of the promptitude in the despatch of e regular business of the office. It is highly creditable to all ranches of the office.

A new feature for the year is to be found in a special appendix the Weekly Weather Report, dealing with the results of wind easurements. The curves derived from the 26 anemometers in e United Kingdom which come to the office are now all tabulated mediately upon their receipt, and a summary is prepared for each onth exhibiting the number of hours during which the force of the ind at the several stations has been within the limits assigned for uccessive numbers on the Beaufort scale. The annual summary ompiled from these twelve monthly sheets is published in the ppendix referred to, together with the monthly results for winds of ale force and particulars of the occurrence of strong gales (force 9), nd of gusts of storm force (force 10 and upwards, velocity xceeding 55 miles per hour). For these latter, data were ontributed also for Edinburgh Observatory through the co-peration of the Astronomer Royal for Scotland. The result ives a conspectus of the results of wind measurements for the ritish Isles more effective than anything which has appeared eretofore.

For the year 1910 the Committee have arranged with H.M. tationery Office for the use of two colours, blue and black, in the thographic reproduction of the charts of pressure, the paths of epressions, temperature and sunshine of the Monthly Weather eport as well as those of rainfall, contributed to the Report by the ritish Rainfall Organization. The results, which depend upon the e of four tints of blue upon black outline, represent what can be ne with the use of two lithographic stones. Before the adoption this arrangement, specimen charts were prepared exhibiting the rresponding data for the very rainy week of October, 1909, ding with the 30th, and these are reproduced in this report, ates II. and III. The Committee think that the improvement us introduced into the representation of the results will be nerally acknowledged, and they wish to record their thanks to e Controller of H.M. Stationery Office for his assistance in inging the proposal to a practical issue.

Observations at Stations of the Second Order.—The completion of e volume for 1907, which is now in the press, will finally wipe off e arrears of that publication, and more time will thereafter be ailable for the discussion of the accumulated data.

Occasional Publications.—The English edition of the *Codex of ternational Resolutions* is found to be very useful in providing e means of informing meteorologists in the United Kingdom and e Colonies as to the conventions upon which the international change of data is based.

In the course of preparation of the work on the *Free Atmosphere in the Region of the British Isles*, glass models shewing the distributions of temperature and pressure up to a height of 15 miles on 27th and 29th July, 1908, were constructed in the Office by Miss Humphreys, and from the data shown thereon the frontispiece of the publication was prepared. The models were exhibited at the Conversazione of the Royal Society in June, 1909, and at a meeting of the Royal Meteorological Society in March, 1910. Photographs were shown at the meeting of the British Association at Winnipeg. Permission was given to the Royal Meteorological Society to reproduce the photographs in the Quarterly Journal. Two of them are included in this Report as Plates IV and V. They are the first representations of the distribution in three dimensions of the meteorological elements in the higher regions of the atmosphere.

Monthly Outline Sheets for marine work have been prepared to the scale of 1 : 20,000,000, and form together a developable globe of about 2 feet in diameter. The geographical part of the work is completed and the outlines are in the press. The tinting of the various areas to show the normal distribution of the meteorological elements will be taken in hand next.

The issue of an Atlas of Tropical Hurricanes will be deferred until the new year's issue of the charts of the Indian Ocean is completed, as the charts will now show the tracks of hurricanes in the South Indian Ocean which were originally the subject of a separate publication. The proposal to prepare an Atlas of Tropical Hurricanes arose from the edition of that volume having been exhausted.

Progress has been made with all the other publications which have been authorised. In connexion with the application of the normals obtained at the Observatories in climatology, Mr. Lempfert has prepared a paper showing how the results for mean maximum and minimum temperatures at a station are affected by the time at which the instruments are read and set. As a result, it has been necessary to revise the instructions for setting the grass minimum thermometer at the climatological stations. He has also discussed the computation of daily mean temperature from the maximum and minimum, and the computation of accumulated temperature from the weekly averages of maxima and minima.

Contributions to other Official Publications and to Scientific Journals.—In addition to the occasional publications issued by the authority of the Committee, the following contributions to meteorological science may be referred to :—

In May, 1909, the Director of the Office was appointed by the Prime Minister to be a member of the Advisory Committee for Aeronautics, and in compliance with the request of the Committee he has prepared memoranda upon (1) *Wind structure*, (2) *Vertical motion in the atmosphere*, (3) *Rotary motion in the atmosphere*, (4) *The Beaufort scale of wind force and the formulæ used in anemometry*. The first was illustrated by numerous reproductions of anemometric records in possession of the Office. These

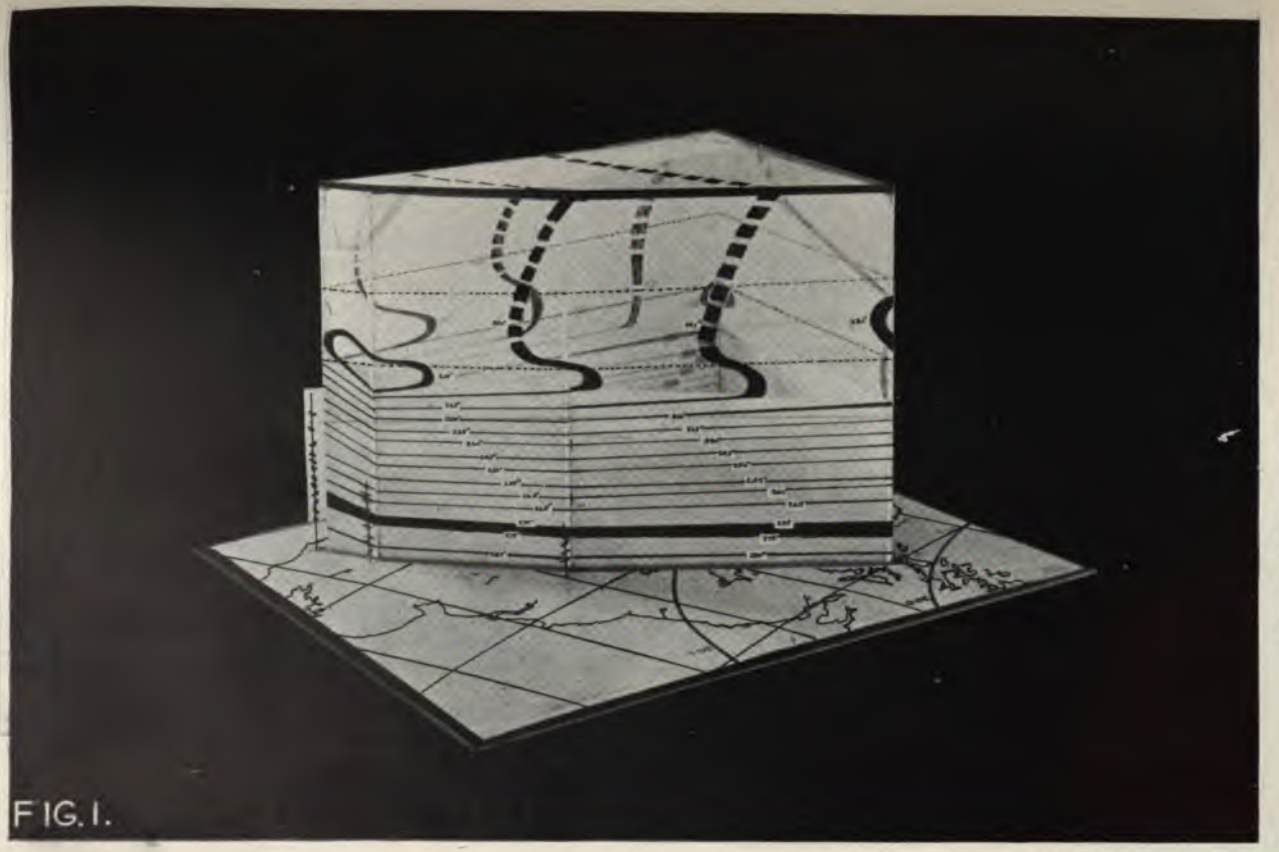
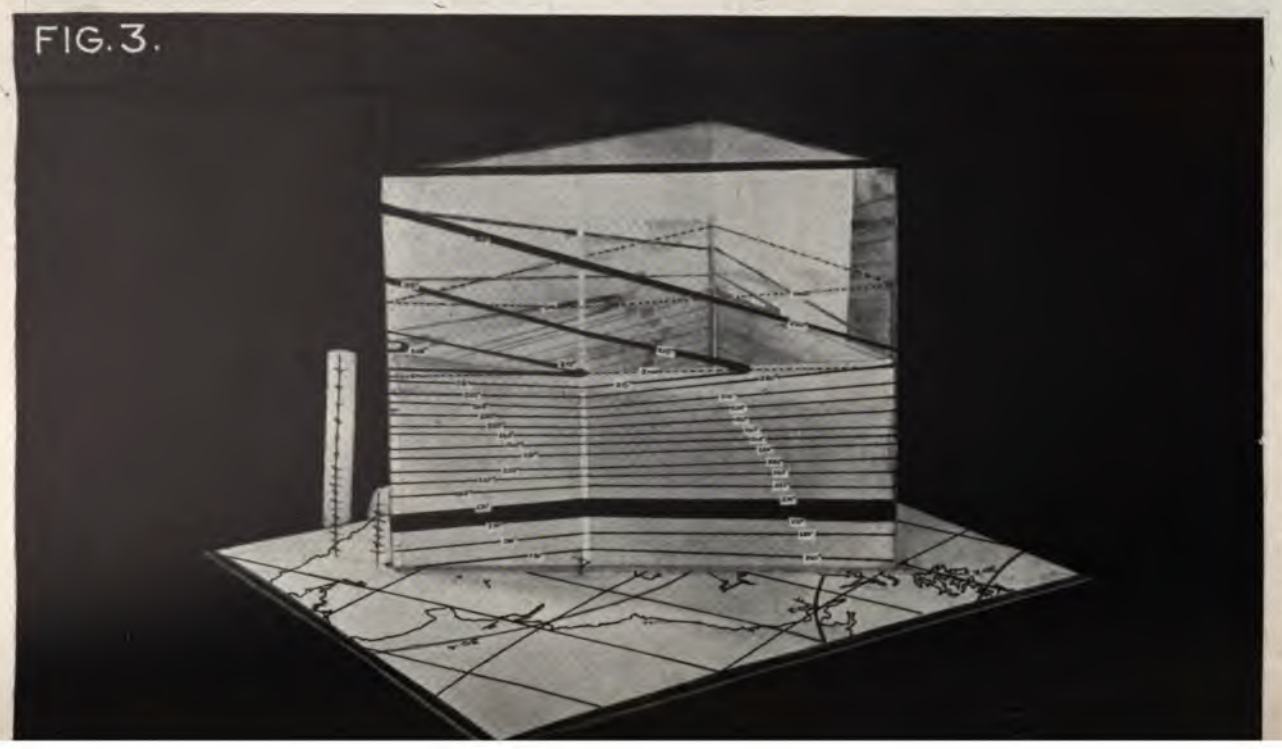


FIG. 1.

From observations taken on July 27th, 1908. Block seen from the north-east. Isotherms are shown for each 5° Absolute from 280° A. to 215° A. The space between the isotherms of 270° and 275° is filled in; for other isotherms a thickness corresponding with ½° C. is covered. The beaded lines in the stratosphere are isobars for 0·2 megadyne and 0·1 megadyne per square centimetre respectively. The arrows on the standards face the wind as determined by observations with theodolites.

[*To face page* 13.

Plate V.—TEMPERATURES and PRESSURES in a block of ATMOSPHERE 15 miles thick over a triangular portion of the BRITISH ISLES.



From observations taken on July 29th, 1908. Block seen from the north-east. Isotherms are shown for each 5° Absolute from 285° A. to 205° A. The space between the isotherms of 270° and 273° is filled in; for other isotherms a thickness corresponding with ½° C. is covered. The beaded lines in the stratosphere are isobars for 0·2 megadyne and 0·1 megadyne per square centimetre respectively. The arrows on the standards face the wind as determined by observations with theodolites.

memoranda are published in the Report of the Advisory Committee The following papers may also be enumerated :—

By Dr. Shaw : *The variations of currents of air indicated by simultaneous records of the direction and velocity of the wind.* Q.J. Roy. Met. Soc., vol. 36, p. 25, 1910 ; read December 15, 1909.

By Mr. Lempfert and Mr. Corless : *Line squalls and associated phenomena.* Q.J. Roy. Met. Soc., vol. 36, p. 135 ; read February 23, 1910.

By Mr. Gold, Schuster Reader in Meteorology : *Der tägliche Gang der Temperatur in* 1 *und* 2 *km. Höhe in der freien Atmosphäre.* Sitzber. Ak. Wiss. Wien, vol. 118, part 2, p. 1207, 1909. *The semi-diurnal variation of rainfall.* Q.J. Roy. Met. Soc., vol. 36, p. 21, 1910. *The relation between periodic variations of pressure, temperature and wind in the atmosphere.* Phil. Mag., Jan., 1910.

By E. Gold and W. A. Harwood. *Report on the present state of our knowledge of the upper atmosphere as obtained by the use of kites, balloons and pilot balloons.* B.A. Report, 1909.

By E. Gold and W. Schmidt. *Testing of registering balloon apparatus at low temperatures.* Q.J. Roy. Met. Soc., vol. 35, p. 275, 1909.

The duty of seeing through the press an important work by Rev. E. Goetz, S.J., of Buluwayo, on the rainfall of Rhodesia was undertaken by Mr. Lempfert.

Colonial Observations.—Progress is being made towards organised co-operation between the different parts of the British Empire in the supply of data on a uniform plan for the information of the various Governments and other persons interested, and for the use of meteorologists of all countries. All the observations received in manuscript at the Meteorological Office are now reduced and tabulated month by month as they come in, so that the year's results are ready for consultation or for publication without delay.

As an illustration of the results thus obtained a diagram representing the distribution of sunshine in different parts of the day at George Town, British Guiana, for the several months of the year, is reproduced as a frontispiece, Plate I, with a corresponding diagram for Kew Observatory. The results for George Town are for three years only, but for that period they show that in October 90 per cent. of the hours just before mid-day are sunny hours, whereas for Kew 50 per cent. of sunshine is the highest percentage of sunny hours shown on the diagram.

The meeting of British meteorologists convened for May, 1908, by the Royal Society of Canada through the good offices of the Canadian Government was postponed till 1909, when the British Association met at Winnipeg. The British and Colonial meteorologists there present met and appointed a Committee to draw up a circular letter inviting the co-operation of all meteorological institutions or Governments concerned in completing the contribution of the British Empire to the meteorological data for the globe, at the rate of two stations for every 10° square, as suggested by the Solar Commission of the International Meteorological Convention at its meeting in London in June, 1909, and in organising an exchange of data for the British Empire that will place the various economic centres of the Empire in possession of the necessary information about the weather in the

various possessions. It was thought best in the first instance to obtain the signatures of the larger Government meteorological institutions of the Empire, and after consulting the Colonial Office the circular was sent out, signed by the Directors of the Meteorological Offices of London and Toronto, to the Government meteorologists of seven of the dominions or colonies. So far it has received cordial approval from Australia, the Cape of Good Hope, and the Transvaal.

An endeavour to secure from the Colonial Government the loan of instruments for a private observer in Dominica, West Indies, has failed, because the Executive Council is of opinion that the results from a single station would give a misleading representation of the meteorology of the island.

International Co-operation : i. Scientific Aeronautics.—A meeting of the International Commission for Scientific Aeronautics was held at Monaco by invitation of H.S.H. the Prince of Monaco, on April 1st, 1909. On account of ill-health the Director was unable to attend. Mr. C. J. P. Cave attended the meeting and furnished a report of the proceedings which at his request was forwarded to "Nature," and was printed in that journal on 20th May, 1909.

It is interesting to note that proposals for expressing measurements of pressure in the upper air in C.G.S. units, which have been adopted for the corresponding work in this country since the beginning of the year 1909, were made independently by Professor W. Köppen, of the Deutsche Seewarte, and Professor V. Bjerknes, of Christiania. The proposals were referred to the International Meteorological Committee.

—— ii. **Maritime Weather Signals.**—Meetings of the Commission appointed at Paris in 1907 for the consideration of an international scheme of maritime weather signals and other questions relating to marine meteorology were held at the Office in London on June 22nd–25th, 1909, under the presidency of the Director of the Office. It was attended by Professor Willis Moore, Chief, with Mr. C. F. Talman, Librarian, for the United States Weather Bureau; Mons. A. Angot, Director, for the Bureau Central Météorologique, Paris; Professor Grossmann, in place of Admiral Herz, for the Deutsche Seewarte; the Rev. L. Froc, Director of the Observatory, Zi-ka-wei, China; Professor H. Mohn, Director of the Norwegian Meteorological Institute. A statement of the present practice of various countries in regard to maritime weather signals was drawn up, and a proposal for an international scheme, based upon two cones for day signals and two or more lights (red or white) in vertical line for night signals, was drawn up to be reported to the International Meteorological Committee. Since the close of the meeting attention has been called to the risk of confusion likely to result from the use of two lights, one above the other, for weather signalling at night. The question will come before the International Meteorological Committee at a meeting in Berlin in September, 1910.

—— iii. **Weather Telegraphy.**—Meetings of the Commission for Weather Telegraphy, also appointed at Paris in 1907, were held at the Office in the same week as those of the Commission for Maritime Weather Signals. They were attended by Mons. A. Angot, Professor Willis Moore with Mr. C. F. Talman, Professor Grossmann, Professor H. Mohn, with the Director of the Office as

esident. The Naval Attaché of the American Embassy and . P. Polis of Aachen, who has given special attention to the use wireless telegraphy were also present. A number of proposals the alteration of the International Code of Weather Telegraphy re considered, originating principally with the Deutsche Seewarte, l having for their object mainly the introduction into the scheme Daily Reports an indication of the barometric change in progress the time of observation. A number of resolutions were adopted ich will be referred to the Meteorological Offices of this country l the Continent for their opinion, and finally dealt with by the ernational Meteorological Committee. The question of reports radiotelegraphy from ships crossing the Atlantic was also sidered by the Commission.

The reports of the Commissions for Maritime Weather Signals l for Weather Telegraphy have been printed.

—— iv. **Solar Commission.**—A meeting of the Solar Commission the International Meteorological Committee, which was appointed Southport in 1903 to deal with the correspondence between solar l terrestrial changes, under the presidency of Sir Norman Lockyer, s held in the rooms of the Royal Society on June 28th and 29th, 09. For the use of the Commission a list of stations to represent meteorological conditions of the globe, arranged according to -degree squares, was prepared, on the basis of a distribution of not re than two stations to a 10-degree square, except for a few ares in Europe for which three stations were selected, and a few er squares for which both high and low level stations are ailable. The provisional list of stations gives the following mmary showing the number of stations for the different untries :—

SUMMARY SHOWING PROVISION OF DATA BY DIFFERENT COUNTRIES.

Austria-Hungary	4	Holland (Home)	1
Australia	29	„ (Colonial) ...	3
Argentina	6	India (Home and Foreign)	40
Belgium	1	Italy (Home)	2
Bolivia	5	„ (Colonial)	1
Brazil	5	Japan	12
Canada	20	Mexico	7
Chile	13	Norway	4
China	2	New Zealand	4
Costa Rica	1	Portugal (Home)	1
Germany (Home)	2	„ (Colonial) ...	8
„ (Colonial) ...	14	Russia and Finland ...	62
Denmark (Home)	1	Roumania	1
„ (Colonial) ...	9	Spain (Home)	1
Egypt	10	„ (Colonial)	4
Ecuador	3	Sweden	3
France (Home)	3	Switzerland	1
„ (Colonial)	32	Turkey	1
Great Britain (Home) ...	3	Uruguay	1
„ „ (Colonial) ...	49	United States (Home) ...	26
Greece	1	„ „ (Colonial) ...	5

The list of stations is printed for the Board of Education as an pendix to the Report of the Solar Physics Committee for 1909.

Since the meeting of the Commission Mr. Lempfert has taken t all the data for a single month for the stations on the list that e to be found in the publications contained in the library of the fice. For this purpose the latest January that could be selected

was that of the year 1905, and there are many gaps in the list, on account of the lack of observations or the lack of publications. Many of these gaps refer to stations in British Possessions, and it is on that account that an endeavour was made at the informal meeting of British meteorologists at Winnipeg to promote the collection of a homogeneous series of data for the British Empire.

—— v. **Telegrams from the Iberian Peninsula.**—As President of the International Meteorological Committee the Director of the Office was asked to obtain the good offices of His Britannic Majesty's Government in securing an acceleration of the morning telegrams conveying weather reports from stations in Spain and Portugal. A memorandum setting forth the conditions which it was desired to improve was drawn up, forwarded by Your Lordships to Secretary Sir E. Grey, and by him communicated to His Majesty's representatives at Madrid and Lisbon. In response to the representation the Spanish and Portuguese Governments have been good enough to take steps for accelerating the service, and considerable improvement has resulted as regards the time of arrival in this country of messages from Corunna and Lisbon. The Committee have not yet learned whether, as may be anticipated, the improvement has also been noticed as regards the messages to Paris, Hamburg, de Bilt, Vienna, and Rome. They trust, however, that these important steps towards the completion of the system of exchange of information for Western Europe have already been secured.

New Premises for the Office.—The new building at South Kensington designed by the Office of Works to accommodate a branch Post Office and the Meteorological Office is nearing completion, and the Committee have been occupied in the consideration of the details of the arrangements for fitting and furnishing the portion of the building which the Office is to occupy in consideration of the payment of a fixed annual rent of £640, in accordance with the terms laid down by Your Lordships in letters to the First Commissioner of Works dated 30th May, 1907, and to the Director of the Office, dated 16th September, 1908. They have still under consideration the necessity of providing for the reproduction of charts, etc., on the premises, in view of the great distance of the Office from the lithographer's workshops. These have recently been removed to Denmark Hill, S.E., so that a long time is already occupied in carrying the finished transfers of the daily reports to the press and in carrying the made up packets thence to the Central Post Offices. The distance will be further increased by the removal to South Kensington. A small hand printing press has always been kept at Victoria Street and worked by the Office staff. There is suitable accommodation in the new premises available for a machine press. Much economy of time and trouble would result from having the lithographic work done in the Office itself. The Committee are in communication with H.M. Stationery Office upon the subject.

Arrangements are in progress with a view to transferring the work of the Office to the new building in October of the current year.

Central Observatory for the Office.—The approaching completion of the new building and the necessity for making suitable provision for the work of the Office for a further period of five years, upon

the termination of the first period of appointment of the Committee under Your Lordships' minute of 20th May, 1905, have given rise to prolonged negotiations with the Royal Society and the National Physical Laboratory with regard to the provision of a Central Observatory for the Office. In 1866 when the administration of the Meteorological Office was placed by Government in the charge of a committee appointed by the Royal Society, it was arranged that the Kew Observatory, which at that time was lent to the British Association, should be regarded as the central observatory for the British Meteorological Service and the two institutions were worked in close relationship. The Meteorological Office undertook to make payments to the observatory for meteorological work done on its behalf, while the expenses of the observatory in respect of work in meteorology on its own initiative, in terrestrial magnetism and solar physics, and in testing instruments were provided for either by a grant from the British Association or by fees.

In 1871 the British Association withdrew its support and the situation was met by Mr. J. P. Gassiot, F.R.S., with a gift of £10,000 placed in charge of the Royal Society on trust for the maintenance of the observatory. A committee was appointed by the Royal Society to manage the observatory and administer the Trust.

In 1899 the National Physical Laboratory was established with the observatory as its temporary headquarters and the management of the observatory passed to the Director of the Laboratory and the Executive Committee. Soon afterwards the magnetic work of the observatory became so seriously disturbed by electric tramways that Government provided a new observatory at Eskdalemuir, Dumfriesshire, and added a grant at the rate of £1,000 a year for its maintenance dating from 1st July, 1907. The grant is paid to the Royal Society and the new observatory is associated with Kew Observatory under the administration of the National Physical Laboratory.

In the course of these numerous changes the association of the Kew Observatory with the Meteorological Office has become less close, and it has become necessary to provide for a good deal of work which is ordinarily done by the central observatory of a Meteorological Institute, to be done by the office staff under unfavourable conditions. In the new premises it would be possible to make some provision for the training of the staff in the practical work of observing and to carry on experimental work. To that extent the new office could be made to serve as a central meteorological observatory, though it would not provide for the continuity of the records which have been furnished to the Office from Kew Observatory since 1867. The Committee decided that they were justified in regarding the other functions of a central observatory as of greater importance and accordingly in May, 1909, they gave notice to the National Physical Laboratory that they were not prepared to continue their grant towards the expenses of Kew Observatory beyond 31st December, 1910, in a letter from which the following paragraphs are taken :

"The grant in question is allocated for the work of a station of the first order "at Kew Observatory, and certain other services rendered by the Laboratory in

"accordance with the memorandum of the Chairman of the Meteorological "Council drawn up in 1899 as a statement of the relations then existing "between the Kew Observatory Committee and the Council."

"The Committee are of opinion, in view of the changes of circumstances that "have occurred since 1899, that the arrangement then formulated no longer "meets the requirements of the case, and they have requested me to intimate "that they do not see their way to continue the grant upon the terms then laid "down."

"It is unnecessary to enter into details as to the grounds upon which the "Committee base their opinion, but I may say that in their view the control "and organisation of the work of the first order stations should be exercised "directly from the central office, and the relations between the Office and its "central observatory should be of a different order from those which have "gradually established themselves since 1866 between the Meteorological Office "and Kew Observatory. They do not regard the maintenance of a first order "station merely for the purpose of continuing the existing record for the "London district as so urgent a requirement from the meteorological point of "view as other demands upon their funds."

To this letter a reply was received on 30th October, 1909, transmitting as an alternative to the withdrawal of the grant a proposal for a scheme of management of the three observatories, Kew, Eskdalemuir, and Valencia, drawn up by a committee appointed by the Royal Society together with representatives of the National Physical Laboratory including among them the Director of the Meteorological Office. By this scheme the work of the observatories would be withdrawn altogether from the administration of the National Physical Laboratory and their staffs incorporated with that of the Meteorological Office under the control of the Director and the Meteorological Committee, with the scientific advice of a committee appointed by the Royal Society to administer the Gassiot Trust. In justification of an application for an addition to the Parliamentary Grant for meteorology in order to make up for the loss to the observatory of the income derived from the testing of instruments, which would remain with the National Physical Laboratory, the following grounds were put forward.

"Two much needed reforms would thereby be secured, viz :—

"*First*, the consolidation of the work of the National Physical Laboratory, "and the separation therefrom of the work of observing and experimenting in "meteorology and geophysics.

"And, *secondly*, the provision of an effective observatory and experimental "station for the purposes of the Meteorological Office, with opportunities for "independent research under the supervision of a Committee of the Royal "Society.

"The importance of a central meteorological institution has been urged on "several occasions. The duties to be assigned to it comprise :—

"(1) The examination of instruments required for the stations ;

"(2) The examination of all questions concerning instrumental equipment ;

"(3) The trial of new instruments and methods ;

"(4) Meteorological research depending on observational methods ;

"(5) The routine of a station of the first order.

"There has always been an intimate connection between Kew Observatory "and the Meteorological Office, and the formal engagements subsisting between "these bodies were continued when Kew became a department of the National "Physical Laboratory. But while nearly all the above duties came within the "province of the Laboratory, yet having regard to the demands made by the "other departments of its work, the possibility of making the Observatory "effective as the Central Meteorological Observatory for the Kingdom has "grown less and less.

"At the same time the need for such an observatory has increased ; the range "of subjects which enter into meteorology has widened, and it has become

"more and more clear that scientific investigations extending over a wide field "can be utilized effectively in promoting the daily work of the Meteorological "Office."

The Committee asked for some modifications of the draft proposal; ultimately agreement was arrived at and the proposal forwarded to Your Lordships with the cordial concurrence of the Committee expressed in the following terms in a letter to Your Lordships covering the estimate for the expenses of the Office for the year 1910–11 :—

"The scheme is set forth in outline in a memorandum which has been "communicated to the Committee by the Royal Society, and which will be "submitted for Their Lordships' consideration by the President and Council. "The Director was a member of the Committee which was entrusted with the "preparation of the memorandum for the consideration of the Royal Society. "The scheme has the cordial and unanimous approval of the Meteorological "Committee. They consider the proposal to afford an opportunity for a most "important step in the progress of the Office.

"The Committee do not fail to recognise that as the Director of the Office "would become also the Director of the observatories, the scheme makes the "Committee also responsible for the administration of the whole of the work "which it is proposed should remain at Kew, and which includes terrestrial "magnetism and other subjects not strictly meteorological, and also for the "work of the observatory at Eskdalemuir which is mainly magnetic. A great "increase of responsibility would, therefore, fall upon the Director. They "recognise also that the grant-in-aid now administered by the Committee is for "the expenses of the Meteorological Office, the operations of which have hitherto "been limited to meteorology. They have been held to include atmospheric "electricity and solar radiation, but to exclude terrestrial magnetism and "seismology. They note, however, that the funds at the disposal of the "Committee for the maintenance of observatories will be augmented, under "suitable conditions, by sums entrusted to the Royal Society, viz., £1,000 a year, "the Government Grant for the maintenance of the observatory at Eskdale-"muir, and about £450 a year, the income of the Gassiot Trust, a private "endowment for the maintenance of physical observations and experiments at "Kew Observatory. As part of the conditions, the Society provides an advisory "committee of scientific experts in the subjects to which these funds are to be "devoted. It would be necessary for a separate account of the expenditure at "the three observatories to be rendered to the Gassiot Committee in order that "it may be reported to the Royal Society.

"The Committee do not doubt that it will be possible by the consideration of "the detailed statement upon which the estimates of the Office are based each "year to see that the appropriation of the funds, in accordance with the "understanding set forth in the scheme, is strictly within the terms of the "Parliamentary Grant.

"The relations between the different branches of geophysics are becoming "more and more intimate, and there are indications that seismological observa-"tions may in the near future be utilised for purposes of weather forecasting. "The variations of terrestrial magnetic force which it is the object of a magnetic "observatory to record, seem to be due to movements in the upper regions of "the atmosphere, and may therefore reasonably be included in the subject of "meteorology. The Committee therefore view with great satisfaction the "prospect of the staff of the Office being brought in close connection with the "work of an observatory in which all sides of meteorological and geophysical "study are dealt with. Further, they regard the practical possession by the "Committee of a central observatory as affording an indispensable means for "the proper training of the staff of the Office, and as enlarging very widely the "possibility of doing useful scientific and practical work by the employment of "voluntary or student assistants.

"They are further of opinion that the deliberations of the Gassiot Committee "as proposed under the scheme will bring the work of the Office to the

"cognisance of a number of distinguished workers in meteorology a
"subjects, and this circumstance of itself constitutes a substantial re
"tion of the scheme."

In response to this joint representation on the part of t
Society and the Meteorological Committee, Your Lords
approved of the principle of the proposal and have unde
ask Parliament for an increase of the Grant for Meteo
carry it out, with the stipulation that, as a temporary me
testing work which remains with the National Physical L
should still be carried on in the buildings of the Kew Ob
under the Superintendent as heretofore, and that part of th
of the Superintendent should be provided by the Laborat
Committee are accordingly making arrangements to take
Superintendent and five members of the staff of Kew Ob
and the staff of the Eskdalemuir Observatory in accord
Your Lordships' decision, to take effect from 1st July, 19

Estimates for 1910-11.—The Committee desire to exp
thanks to Your Lordships for the consideration which
given to the statement of the financial position of the
logical Office at the close of the first period of appointme
Meteorological Committee 1905–1910, which was forwa
the letter covering the estimate of expenses of the Offic
year 1910–1911.

Aeronautics.—The contribution of the Director to the
the Advisory Committee for Aeronautics has already b
tioned (p. 12).

In presenting an interim report to the Prime Mi
Advisory Committee included in the programme of wo
undertaken investigations with a view to throwing additi
upon the questions of vertical motion and rotary moti
atmosphere. In the estimates for the current year a
assigned for this work, and at the request of the
Committee the Director arranged for the investigatio
carried out under his direction at Pyrton Hill by Mr. J.
in consultation with his father, Mr. W. H. Dines, F.R.S
in charge of work for the Office in connexion with the inv
of the upper air.

It is recognised that much information of great impo
aerial navigation is comprised within the records belongi
Office, but that no adequate facilities exist for brin
information effectively to the knowledge of practical
The work included in the course of lectures referred
subsequent section is intended to give necessary pr
information, and at the request of the Advisory C
arrangement has been made for placing on exhibition
records, diagrams of variation of velocity with height,
documents of practical interest in connexion with the nav
the air. In the present premises there is neither space
venience to carry out the idea in a proper manner, but it
a regular part of the programme for the museum which is
in the new building at South Kensington.

Many inquiries for forecasts and other information h
received in the course of the year from aeronauts. So f

Office is concerned, M. Paulhan's flight from London to Manchester was noteworthy for the elaborate provision that was made to keep him supplied with information of various kinds about the prospective state of the weather on his line of route.

Scale of Fog Intensity.—Among the miscellaneous work of the Office in the course of the year note should be made of an endeavour to fix the distance of visibility by day and by night for fogs of recognised intensity, according to the scale now adopted by the Office and by the Admiralty, by which a clear horizon is indicated by the figure 0 and the densest fog by the figure 5. The figures of the scale are based upon the interference of the fog with traffic, and it is desirable to form some definite idea as to how far off a vessel or light is visible firstly when a fog horn is sounded by navigators as a matter of ordinary precaution, and secondly when extreme caution is judged to be necessary. The matter has been taken up with the Elder Brethren of Trinity House, and arrangements were made for observers at six lightships to note the state of atmospheric obscurity according to the scale 0 to 5 as judged by the requirements of traffic, and at the same time to note the known land and sea marks which were visible or invisible. The returns have come in and are being examined. Some of them are extraordinarily conflicting, but others group themselves in a very orderly manner. It seems to depend largely upon the particular lightship selected. A report upon the subject will be prepared in due course.

Educational.—Meetings for the discussion of important contributions to meteorological science, principally in colonial or foreign journals, were held at the Office on alternate Monday evenings during the winter months as in previous years.

The Director, as Reader in Meteorology in the University of London, gave a course of lectures on Forecasts of Weather at the London School of Economics, Clare Market, in the Lent Term of 1910. The lectures have been prepared for publication in book form.

Captain Hepworth gave two lectures at the Royal Naval War College in January, 1910.

At the request of Sir J. Brigg, M.P., a syllabus of a course of instruction in weather study in elementary schools was prepared for presentation to Mr. Runciman.

A large number of requests for surplus copies of the Daily Weather Report for use in schools have been complied with, and subscriptions for the Daily Weather Report for schools have been received from all parts of the country.

In connexion with the preparation for discussions, lectures, and the reading of papers, a collection of lantern slides has been accumulated which are available for educational purposes.

A memorandum setting forth the arrangements made by the Office for educational purposes has been drawn up.

Magnetic Observations at Valencia.—The magnetic observations at Valencia, in co-operation with the magnetic work of the National

Physical Laboratory, under an arrangement with a committee of trustees, of which the late Earl of Rosse was the principal, have been continued.

Acknowledgments.—The Committee have again to acknowledge the courtesy of the Portuguese Government, Major Chaves, and the Commercial Cable Company, in connexion with the daily telegrams from the Azores; the Eastern Telegraph Company and the Great Northern Telegraph Company, in connexion with telegrams from the Azores, the Iberian Peninsula, and the Scandinavian kingdoms.

Acknowledgments are also due to many public departments, local authorities, and private observers in all parts of the kingdom.

The reports of the work of the several branches of the Office are as follows:—

I.—Marine Branch.

Collection of Information.—The arrangements for the systematic collection of data, for the purposes of marine meteorology, from officers of the Royal Navy and the Mercantile Marine, have been continued as in previous years. The number of vessels entered in the Office books as equipped with meteorological instruments lent by the Office, for the purpose of keeping a meteorological log, was 206 as compared with 183 last year. Meteorological four-hourly log books, registers, and other documents, to the number of 2,674 were received during the year. A list of these is given in Appendix IV. Of the meteorological log books which contain four-hourly observations, 210 have been classed as "excellent," or "very good," as compared with 171 for the year 1908–9.

Supplementary Information.—The arrangements for obtaining meteorological registers from the captains and officers of ocean-going ships who use their own instruments have been continued, and a large amount of information has thereby been collected, which is immediately utilised in the Monthly Meteorological Charts of the North Atlantic and Mediterranean, and of the Indian Ocean and Red Sea.

The following list shows the number of contributions classified according to the different lines of route:—

Four-hourly Logs.

Greenland	Whaling		4
Cable Ships	United Kingdom		2
	North Atlantic		2
North Atlantic	Canada		2
	United States		8
	Gulf of Mexico		24
	West Indies		9
Mediterranean			3

Black Sea		4
Africa	West Coast	1
	S.E. and E. Coasts ...	10
East Indies ...	viâ Cape	12
	viâ Suez	48
China and Japan	viâ Cape	1
	viâ Suez	20
Australia ...	viâ Cape	16
	viâ Suez	30
Trans-Pacific		7
New Zealand, viâ Capes		30
South America ...	East Coast	32
	West Coast	7
United States, West Coast		1
Surveying ...	West Coast of Africa ...	2
	China Sea	3
	Ceylon	1
	Vancouver	1

"Short" Logs.

Mediterranean	6
Cape of Good Hope to St. Paul's Island ...	1
Trans-Pacific	2

North Atlantic Registers (*Form No.* 121), *Indian Ocean Registers* (*Form No.* 122), *and Radio-Telegraphy Registers* (*Form No.* 138).

Routes.		North Atlantic Registers. Form No. 121.	Indian Ocean Registers. Form No. 122.	Radio-telegraphy Registers. Form No. 138.
Cable Ships ...	United Kingdom	1	—	—
North Atlantic ...	Canada	435	—	182
	United States ...	830	—	333
	Gulf of Mexico ...	105	—	—
	West Indies ...	165	—	—
Mediterranean		265	—	—
Black Sea		8	—	—
Africa	West Coast ...	25	—	—
	S.E. and E. Coasts	7	—	—
East Indies ...	viâ Cape	2	16	—
	viâ Suez	3	222	—
China and Japan	viâ Cape	—	1	—
	viâ Suez	—	16	—
Australia ...	viâ Cape	—	6	—
	viâ Suez	—	14	—
South America ...	East Coast ...	38	—	—
	Total	1,884	275	515

Recognition of "excellent" observers.—Appendix III. (p. 98) contains a list of the captains who, during the past year, have contributed logs classed as "excellent." Several of these observers

have co-operated with the Office for many years. The names which appear in the list for the first time are as follows : –

Captain's Name.	Steamship.
Chudley, T. H., Lieut., R.N.R. ...	Kia Ora.
Griffiths, A. M.	Hillmere.
Hanson, F. W. A., Lieut., R.N.R. ...	Wilcannia.
Henderson, S., Lieut., R.N.R., R.D.	Durham Castle.
Hunt, A.	Bohemia.
Mais, E.	York Castle.
Moodie, J.	Camphill.
Morrison, D.	City of Corinth.
Steeves, T. G.	Jason.
Weir, A. R.	Clan Macintyre.

As a mark of recognition of valuable co-operation, the Director has presented various publications of the Office to observers who have returned well-kept meteorological log books.

Obituary.—The Committee note with regret the deaths of four of their old observers during 1909 :—Captain W. Scotland, S.S. *Kumara*, in May ; Captain G. Nicole, S.S. *Maori*, in August ; Captain H. Parsell, Lieut., R.N.R., S.S. *Britannic*, in November ; and Captain E. Gates Jones, Lieut., R.N.R., Ship *Grace Harwar*.

Use of Information received.—The information collected has been used in the preparation of the monthly meteorological charts of the North Atlantic and Mediterranean, and of the Indian Ocean and Red Sea, as in previous years ; the revision of the Barometer Manual for the use of Seamen ; and for fog and mist charts for the Baltic and the North Sea. Information as to the frequency of fog and mist in different parts of the Atlantic has been prepared, and is now appearing in successive issues of the Atlantic charts. Information was supplied to the Solar Physics Observatory with respect to Snow Hill meteorological observations ; to the Argentine Meteorological Office as to the alleged monsoon regions of the Chilean littoral ; to the Marine Biological Association, sea temperatures of the Indian Ocean and the coasts of the United Kingdom ; to Dr. Vaughan Cornish, observations of ocean waves and swells ; to Captain F. L. Taylor, Lieut., R.N.R., S.S. *Singapore*, navigation of Strait of Magellan ; to the Director-General of Observatories, Simla, meteorological observations from the log-books of ships navigating the Indian Ocean between 6° N. and 45° S. from 20° E. to 130° E. ; to the Deutsche Seewarte, meteorological data for the South Atlantic ; and contributions on ocean meteorology to Lloyd's Calendar for 1910. Information with respect to ice was also sent regularly to the *Shipping Gazette* and the *Journal of Commerce* during the season.

The discussion of meteorological data for the Indian Ocean to 30° S. is completed, and is to be published in the monthly meteorological charts for that ocean (p. 10).

Information supplied to the Admiralty.—Climatological tables have been compiled for various places on the shores of the United

es, the Arctic Ocean, the North Sea, the West Coast of ica, the Pacific Islands, and the Eastern Archipelago, at the iest of the Admiralty.

Hydrographic notices have been extracted from the meteoro- cal log-books of this Office and forwarded to the Admiralty. ong those sent this year were notes relating to Bougainville iit and Tulagi Harbour, received from Captain F. J. Bayldon, ut., R.N.R., S.S. *Moresby*; soundings and bottom specimens miles west of Bantry Bay, from Mr. E. C. Shankland, Sub- ut., R.N.R., S.S. *Cambria*; soundings and bottom specimens, th Preparis Channel, from Captain G. H. Harris, Lieut., I.R., S.S. *Worcestershire*; Comus Shoal and Santa Maria rbour, from Captain F. H. Swain, S.S. *Matina*; and Cape man Lighthouse and Watts Point, from Captain J. Martin . *Akershus.*

II.—Forecast and Storm Warning Branch.

aily Weather Report.—The arrangements for the issue of the ly Weather Report and Forecasts, and for the preparation of rmation for publication in the newspapers, have remained erally the same as those which were in operation last year.

elegraphic Reporting Stations.—The stations from which tele- hic reports are received are shown in the lists given on pp. 68 8 and on Map (Plate X., p. 88).

spection of the Stations.—The stations indicated in the list in endix VI., p. 120, have been inspected during the year. The rts of the inspectors show that efficiency has been maintained.

eports from Madeira.—A daily telegraphic report has been ived from Funchal, Madeira since 1st January, 1910 (*see* p. 7).

eland and Færöe Reports.—The reports from five stations in and and one in the Færöe have been continued throughout the . Since April 1st, 1909, reports from Isafjord, a station in the eme north-west of the Island, have been substituted for those Grimstadir, a high level station in the interior.

Vireless Telegrams.—During the year ended March 31st, 112 less telegrams were received from the ships of His Majesty's y.

the course of the 12 months ending with March, 1910, 4,388 less reports were received from Atlantic liners. The numbers he several months ranged from 670 in May and 649 in April to in December. The indications of a reduction in the time pied in the transmission of the messages (to which reference made in the last Annual Report) have become increasingly lent. During the three months ending with March, 1909, only er cent. of the reports arrived at the Meteorological Office in two hours of the time at which the observations were taken, ufficiently early to be of service in connexion with the weather in current use, and only 18 per cent. arrived within 24 hours. ring the subsequent 12 months, 8 per cent. of the reports ved within two hours, and 42 per cent. within 24 hours of the e of observation.

Reports from Auxiliary Stations.—The information as to the weather in the British Islands has been supplemented by postal and telegraphic reports sent daily from stations belonging to various local authorities (p. 88). The number of such stations is constantly increasing, and the details supplied form a useful addition to the official telegraphic reports.

Discussion of Information.—A detailed account of the manner in which the meteorological information received by telegraph is utilised for the preparation of the Daily Weather Report is given in Appendix II., p. 47.

Weather Forecasts.—The means adopted for the distribution of the forecasts drawn up in the Office have been continued during the past year. They are detailed in Appendix II., p. 49.

Forecasts for H.M. Ships.—Forecasts have been supplied occasionally to His Majesty's Yacht, as desired by the Commodore. They have also been supplied for naval purposes as required by the Admiralty.

Harvest Forecasts.—During the summer months the special service of afternoon forecasts for the benefit of agriculturists and others was arranged as in previous years, and special telegraphic reports of observations at 1 p.m. were obtained for this purpose. These forecasts are sent by telegraph at 2.30 p.m. to those who express a wish to receive them regularly, and who defray the cost of the telegrams.

During the four months, June to September, the forecasts were sent, for varying periods of time, to 103 persons residing in various parts of the United Kingdom. The number was 19 in excess of that in the previous year, and was the largest since the year 1900, when applications for the forecasts were received from as many as 122 persons.

Returns giving a daily record of the weather actually experienced during the period for which the forecasts were sent were received from 30 persons, as against 25 in the previous year.

The results of a comparison made in the Office between the forecasts and the subsequent weather, as entered in these returns, show that for the country generally 87 per cent. of the forecasts were either wholly or partially successful, the value being slightly below the average of the previous nine years. The percentage of complete successes, 36, was considerably smaller than in recent years. At one station in the east of Scotland the percentage of complete success was as high as 71, while in another in the east of Ireland it was as high as 82, but in each case the forecasts were sent only for a short period. For large districts the percentage of complete success varied from 44 in England north east, to 33 in England north west, and the combined percentage of complete and partial success from 90 in England north west, to 82 in the Midland counties.

The decline in the proportion of successes, as compared with that in several previous years, was due to the extremely changeable character of the weather. Some of the heaviest rains were accompanied by a rising barometer, and were not adequately

explained by the appearance of the isobars on the daily weather maps. At various times during the season a forecast of improving weather, though apparently justified by the meteorological conditions prevailing at the time of issue, was followed by a renewal of showery or rainy weather.

Notifications of a Spell of Fine Weather.—The offer on the part of the Office to supply special information of the commencement of a probable spell of fine weather lasting for at least two days, which originated in 1907, has met with an increasing measure of approval. In 1908, applications for such information were received from 22 persons, while, in 1909, the number had increased to 44. In the case of 25 individuals, the special notification alone was required; in 19 other cases it was supplied in addition to the ordinary daily forecasts. During so unsettled a season as that of 1909, the opportunities for the issue of such a notice were rare, but on July 1st and July 19th, intimation was sent to the majority of the English districts; on June 2nd, to England north west; on August 5th, to persons residing in the midland counties, England north west and Ireland south, and again, on September 14th, to one individual in Ireland south. The notifications issued on July 1st, and September 14th, were not justified, the weather for the next two or three days remaining in an unsettled showery state. Those issued on June 2nd, and July 19th, were followed by fine weather lasting for two days; those issued on August 5th by settled weather lasting for more than a week.

Colliery Warnings.—Notice of the approach of a deep depression which may be expected to cause an unusually rapid fall of the barometer has been sent, as occasion required, to the Manager of the "Colliery Guardian."

Other Forecasts.—The arrangements for forecasts for Sea districts and for exceptionally high tides referred to in last year's report have been continued.

Telegraphic Inquiries for Forecasts.—The number of inquiries for forecasts by telegraph, exclusive of harvest forecasts, was 201.

Results of Forecasts.—A comparison for the year of the Forecasts for the United Kingdom issued at 8.30 p.m., with the subsequent weather actually experienced, is given below. The complete success, partial success, partial failure, and complete failure of the forecast as regards both wind and weather, are estimated according to definite rules which are designed to eliminate bias as far as possible.

The term "partial success" is applied to cases in which more than half the details included in the forecast are justified by subsequent events. With regard to *wind* the details comprise direction and force, and anticipated changes in either particular. With regard to *weather* they comprise temperature, the state of the sky (clear, cloudy, or overcast), and the probability of rain, snow, fog, thunder, &c., with occasional indications as to the duration or intensity of any or all of the phenomena mentioned. The term "partial failure" is applied in a similar way to a forecast in which more than half the details given are incorrect.

The detailed comparison of the forecasts with actuality for the year 1909 has been summarised to give results, (1) for the various months, and for the United Kingdom as a whole, and (2) for the various districts, and for the year as a whole.

Summary of Results of 8.30 p.m. Forecasts in 1909.

(*a.*) *Results for the various Months.*

Months.	Percentages.												
	Complete Success.			Partial Success.			Partial Failure.			Complete Failure.			Sum of Successes, Complete and Partial.
	Wind.	Weather.	Average.	Wind.	Weather.	Average.	Wind.	Weather.	Average.	Wind.	Weather.	Average.	
January	75	54	65	23	41	32	2	5	3	–	–	–	97
February	64	56	60	27	38	33	7	5	6	2	1	1	93
March	55	57	56	31	35	33	7	8	8	7	–	3	89
April	64	57	61	25	36	30	2	6	4	9	1	5	91
May	65	54	60	26	36	31	5	7	6	4	3	3	91
June	78	51	65	19	45	32	2	3	2	1	1	1	97
July	49	50	50	44	38	41	6	10	8	1	2	1	91
August	50	51	51	35	39	37	14	7	10	1	3	2	88
September ...	62	50	56	33	45	39	2	4	3	3	1	2	95
October ...	72	48	60	26	43	35	1	8	4	1	1	1	95
November ...	68	53	61	28	42	35	2	5	3	2	–	1	96
December ...	54	41	48	34	47	40	5	10	8	7	2	4	88
The entire Year	63	52	58	29	40	35	5	6	5	3	1	2	93

(*b.*) *Results for the various Districts.*

Districts.	Percentages.												
	Complete Success.			Partial Success.			Partial Failure.			Complete Failure.			Sum of Successes, Complete and Partial.
	Wind.	Weather.	Average.	Wind.	Weather.	Average.	Wind.	Weather.	Average.	Wind.	Weather.	Average.	
Scotland, N. ...	61	57	59	32	40	36	4	2	3	3	1	2	95
„ E. ...	62	53	58	29	39	34	5	6	5	3	2	3	92
England, N.E. ...	63	49	56	31	41	36	4	7	6	3	1	2	92
„ E. ...	67	51	59	28	40	34	3	8	6	2	1	1	93
Midland Counties.	68	49	59	24	45	34	5	5	5	3	1	2	93
England, S. ...	70	50	60	24	41	32	4	8	6	3	1	2	92
Scotland, W. ...	60	55	58	31	38	35	5	6	5	4	1	2	93
England, N.W. ...	61	50	56	32	41	36	4	8	6	3	1	2	92
„ S.W. ...	66	54	60	27	38	33	5	7	6	2	1	1	93
Ireland, N. ...	59	51	55	33	42	37	5	5	5	3	1	2	93
„ S. ...	58	52	54	32	38	35	7	9	8	4	2	3	89
Summary ...	63	52	58	29	40	35	5	6	5	3	1	2	93

The following table shows the success of the Forecasts of the year in comparison with those of previous years. It gives for each year of the decade 1900–1909 the percentages of complete and partial successes of the Forecasts issued at 8.30 p.m. Until the year 1905 the annual period included was that for the 12 months ending with March. The results for 1905 to 1909, given below, are for the calendar year. The sum of successes (complete and partial) in 1909 was the highest on record, but the percentage of complete success was lower than in 1906, and was no higher than in 1908 or in 1901–02.

PERCENTAGES of SUCCESS in the FORECASTS for the whole of the BRITISH ISLES.

Year.	Complete Success.	Partial Success.	Sum of Successes, Complete and Partial.
1900–01 ...	57	27	84
1901–02 ...	58	26	84
1902–03 ...	53	35	88
1903–04 ...	56	30	86
1904–05 ...	57	31	88
1905	56	32	88
1906	61	30	91
1907	54	37	91
1908	58	34	92
1909	58	35	93
Average ...	56·8	31·7	88·5

STORM WARNINGS FOR THE COASTS OF THE UNITED KINGDOM.

Warnings of coming storms have been dispatched by telegraph to stations on the coast supplied with signals to be hoisted as warnings to mariners. The signals are defined in Circular 717 of the Board of Trade, issued in February, 1874. An explanation of the system employed is given in Appendix II.

A list of the stations at which the signals are exhibited is given in Appendix II., pp. 53, 54. At the end of March, 1909, there were 237, of which 127 were in England and Wales, 71 in Scotland, 34 in Ireland, 3 in the Isle of Man, and 2 in the Channel Islands.

A comparison between the warnings issued during the year and the subsequent weather, in accordance with the method indicated in the Report for 1888–9, p. 64, is given in the following table.

Appended to the table are notes respecting the gales for which no warnings were issued, with brief statements as to the circumstances in which they occurred.

Storm Warning Checking.

Comparison between the Warnings and the subsequent Weather in 1909.

Coasts.	Total No. of Warnings.	Warnings justified by subsequent Gales, Force 8 and upwards.	Warnings justified by subsequent strong Winds, Forces 6 & 7.	Warnings not justified by subsequent Weather.	Warnings late. Force 9 reached at two Stations before issue.	Warnings partially late. Force 9 reached at one Station before issue.	Storms occurring without Warning.
Scotland, N.E.	17	4	11	1	—	1	
	18	3	5	2	1	2	Jan. 11–12.
,, E.	12	4	6	1	—	1	
	9	2	4	3	—	—	
,, N.W.	19	5	14	—	—	—	Jan. 11–12;
	19	8	9	2	—	—	Sept. 6–7.
,, W.	12	7	2	3	—	—	Jan. 11–12;
	14	5	5	4	—	—	Apr. 2–3.
Irish Sea	15	9	5	—	—	1	Jan. 11–12; Feb. 5; Apr. 3.
	19	9	7	1	—	2	Oct. 19–20.
Ireland, N.	15	8	4	2	—	1	Jan. 11–12; Apr. 2–3.
	20	11	5	2	1	1	Sept. 6–7.
,, S.	15	10	3	—	1	1	Jan. 11–12; Apr. 2–3; Apr. 20–22; May 4.
	20	8	7	3	1	1	Sept. 6–7; Oct. 5.
St. George's Channel ...	15	6	7	1	—	1	Apr. 2–3.
	17	11	4	1	—	1	
	20	12	6	2	—	—	Mar. 11.
Bristol Channel	16	12	3	—	1	—	Sept. 6–7; Oct. 5; Oct. 19–20; Dec. 14–15.
England, S.W.	16	8	5	2	—	1	Feb. 5; May 4.
	20	11	7	—	—	2	
,, S.	16	7	6	3	—	—	
	22	12	8	1	1	—	
,, S.E.	14	6	8	—	—	—	
	22	11	7	2	2	—	
,, N.E.	14	9	2	2	—	1	Jan. 11–12.
	13	8	5	—	—	—	
,, E.	13	6	7	—	—	—	
	16	7	7	1	1	—	
Totals	213	101	86	17	1	8	
	245	123	83	22	8	9	
Percentages ...	—	47·4	40·4	8·0	0·4	3·8	
	—	50·2	33·9	9·0	3·3	3·6	
For whole year Totals	458	224	169	39	9	17	
For whole year Percentages ...	—	48·9	36·9	8·5	2·0	3·7	

NOTE.—In order to facilitate comparison with the statistical tables of the Board of Trade which are made up for the year ending June 30, the figures for the two halves of the year 1909—January 1 to June 30, and July 1 to December 3 1—are given separately for each district. The upper line of figures in each case gives the particulars for the first half of the year.

GALES EXPERIENCED in 1909 WITHOUT WARNING.

(1) *January 11th–12th. A Westerly to North Westerly gale on the Irish Coasts, in the Irish Sea and in the West and North of Scotland.*—Caused by a secondary depression which appeared in the rear of a large disturbance beyond the Arctic Circle. At 6 p.m., January 10th, when warnings were required, there were no indications of the secondary system.

(2) *February 5th. A Westerly to North Westerly gale in the Irish Sea and the South West of England.*—On the evening of February 4th, a depression was approaching our western coasts and the cones were hoisted in the south of Ireland and the Bristol Channel. The disturbance, which proved to be more serious than was anticipated, moved rapidly eastwards across England, and had reached the north by the following morning. It was then too late to warn the coasts in question.

(3) *March 11th. A North Easterly gale in the Bristol Channel.*—Caused by the extension of an area of high pressure from the northward down our western coasts, and the simultaneous movement northwards of a small depression over France. The gale was reported only at the lightship stations—it was apparently not felt at all on shore.

(4) *April 2nd–3rd. A gale from South and South East on many parts of our western coasts.*—A large anticyclone of considerable intensity covered Great Britain, while a depression over the mid Atlantic extended gradually eastwards, and produced a moderately steep gradient over our western coasts. The conditions did not at any time appear sufficiently threatening to justify the issue of warnings.

(5) *April 20th. A Westerly gale on the South Coast of Ireland.*—Felt only at lightship stations. Nothing more than force 5 was reported at any of the telegraphic reporting stations, and from the distribution of pressure at the time it is not easy to see why any gale occurred in the district.

(6) *April 22nd. A Southerly gale on the South Coast of Ireland.*—Caused by the rather sudden advance of a deep depression from the westward on the night of the 21st. Next morning warnings were issued to all our western coasts excepting the south of Ireland, where the gale had already commenced.

(7) *May 4th. A South Easterly to Easterly gale in the South of Ireland and the South West of England.*—A large anticyclone extended at the time over Great Britain from the continent. The gale was caused by a temporary increase in the barometric gradient owing to the movement

of a depression out in the Atlantic. The changes in pressure appeared far too slight to justify the issue of warnings.

(8) *September 6th–7th. A Westerly to North Westerly gale on many parts of our western coasts.*—Caused by a deep depression which advanced suddenly to the Hebrides from the north westward on the night of September 5th–6th. Very strong winds were forecasted, but the indications on the evening of September 5th did not seem sufficiently threatening to necessitate the issue of warnings.

(9) *October 5th. A South Westerly to North Westerly gale in the South of Ireland and the Bristol Channel.*—A depression of growing intensity appeared off the north of Ireland on the morning of October 5th, and the signals were then hoisted in all our north western districts. The gale extended further south than was anticipated. It was not reported at any of the telegraphic reporting stations.

(10) *October 19th–20th. A South Westerly gale in the Irish Sea and the Bristol Channel.*—Caused by a depression which spread in from the westward. Telegraphic communication with Blacksod Point was interrupted, and the report from that station for October 19th, 6 p.m., was not received until the afternoon of the 20th. Had it arrived in time warnings would probably have been issued on the evening of the 19th to all our west and south-west coasts.

(11) *December 14th–15th. An Easterly to North Easterly gale in the Bristol Channel.*—Warnings were issued with success on the afternoon of December 14th, for an easterly gale on the south and south-east coasts of England. The gale covered a somewhat wider area than was anticipated.

Comparison of results for 1909 with previous years.—The following table contains a statement of the amount of success of storm warnings in each year and the average for the decade 1900–1909 :—

Years.	Total No. of Warnings issued.	Warnings justified by subsequent Gales.	Warnings justified by subsequent strong Winds.	Total Warnings justified.	Warnings not followed by increase of Wind.
		p.c.	p.c.	p.c.	p.c.
1900	512	66·2	25·8	92·0	6·3
1901	498	62·3	26·1	88·4	7·4
1902	535	55·5	32·0	87·5	9·0
1903	757	62·6	27·3	89·9	7·3
1904	539	59·4	30·4	89·8	6·7
1905	632	52·5	35·9	88·4	9·5
1906	739	54·7	33·3	88·0	8·5
1907	573	55·2	37·0	92·2	5·9
1908	628	53·4	32·3	85·7	10·7
1909	458	48·9	36·9	85·8	8·5
1900–09 ...	587	57·1	31·7	88·8	8·0

Averages.—The corresponding figures, giving the average results for the last nine years and for the three preceding decades, are as follows:—

Period.	Total No. of Warnings issued.	Warnings justified by subsequent Gales.	Warnings justified by subsequent strong Winds.	Total Warnings justified.	Warnings not followed by increase of Wind.
		p.c.	p.c.	p.c.	p.c
1871-80 ...	362	51·9	25·7	77·6	16·8
1881-90 ...	507	57·3	25·1	82·4	15·5
1891-1900 ...	518	62·7	27·5	90·2	5·8
1901-09 ...	595	56·1	32·4	88·5	8·2

III.—Statistics and Library Branch.

Climatology of the British Isles.

Distribution of Stations.—A list of stations in connexion with the Office, in which particulars are given of the orders of the stations and of the official publications for which the returns have been prepared, will be found in Appendix II. on pp. 43 to 98.

Clarendon type has been used for the names of stations which have been added to the list in the course of the year.

The distribution of these stations in the various districts may be summarised as follows:—

	—	Normal Observatories.	Normal Climatological.	Auxiliary Climatological.	Telegraphic Reporting.	Sunshine (including Observatories).	Additional Rainfall.	Additional Anemograph.	Additional Barograph.
0.	Scotland, N.	0	6	1	4	6	3	1	6
1.	„ E.	1	5	4	3	9	2	1	3
2.	England, N.E.	0	11	7	2	12	7	2	3
3.	„ E.	0	8	6	2	12	12	3	3
4.	„ Midlands ...	0	10	22	2	18	14	1	3
5.	„ S.E.	0	6	24	2	26	17	3	4
	London District ...	1	4	3	1	8	2	0	2
6.	Scotland, W., and Isle Man.	2	8	5	0	7	3	0	1
7.	England, N.W., and N. Wales.	1	11	12	2	21	6	4	4
8.	England, S.W., and S. Wales.	1	4	15	3	20	24	2	1
9.	Ireland, N.	0	2	2	3	2	5	1	5
10.	„ S.	1	7	9	3	7	9	3	3
11.	Western Channel ...	0	1	1	2	4	0	1	1
	Total	7	83	111	29*	152	104	22	39

* Of these, 13 observe at 7 a.m., 1 p.m., and 9 p.m., and thus come under the international definition of a station of the second order. These stations have not been included in the 83 normal climatological stations.

Records have also been received from 5 thermograph stations, 8 autographic raingauge stations, 1 hygrograph station, 61 sea temperature stations. Daily reports are received by telegraph from 45 foreign stations (*see* p. 87).

Observatories are also maintained at Greenwich (The Royal Observatory), Oxford (Radcliffe Observatory), Bidston (Mersey

Docks and Harbour Board), Southport (the Corporation), an Berkhamsted (E. Mawley, Esq.), and from these, records fo occasions of special interest have been courteously supplied whe asked for.

Changes in Stations.—The normal climatological station Laudale, which has contributed data to the annual volumes " Observations at stations of the second order" since 187 has been discontinued, but the observations of rainfall and temper ture are still being continued and are included in the Weekl Weather Report. The normal climatological station at Rousdo Observatory, from which returns were received through the Roy Meteorological Society, has also been discontinued.

Among the stations which have been started or have come int connexion with the Office during the year, must be mentioned th Observatory at Eskdalemuir, from which regular reports hav been received for incorporation in publications of the Office fro January, 1910; a normal climatological station in connexion wit Mungret College, Limerick; a normal climatological station, whic is also equipped with a recording anemometer, at Llaneugrad i Anglesey; and a normal climatological station established by th Hampstead Scientific Society on Hampstead Heath. The follow ing auxiliary climatological stations have been added to the list Basingstoke, Belper, Matfield, Deal, Seaford, Ruthwell, Paignton Fowey, Sheepstor (Dartmoor). Five new rainfall stations hav been added to the list, while 12 stations of this order have droppe out.

Obituary.—The Committee record with regret the deaths of th following observers:—

Sir John Clark, Bart., who contributed observations fro Tillypronie through the Scottish Meteorological Society.

Mr. A. W. Moore, J.P., C.V.O., who for many years mai tained a station at Cronkbourne, near Douglas. T observations have been continued by the Corporation Douglas.

Mr. T. Turner, J.P., who for many years contribut through the Royal Meteorological Society observatio from Cullompton. The observations are being continued Mr. M. T. Foster.

The Rev. D. Macaulay, who contributed rainfall data fr Sandside, Reay. The observations are being continued.

Inspections.—A list of stations inspected during the year representatives of the Office is given in Appendix VI., p. 119.

Publications.—The statistical publications of the Office have be grouped together under the general title "The British Meteo logical Year Book." All four parts of this publication for 19 were issued before the end of the financial year.

Part I., the Weekly Weather Report, has been issued with thr appendices in the same form as in the previous year. Appendix II the summary of gales experienced during the year at anemogra stations, has been amplified by a table showing for each station t number of hours during which wind velocities corresponding wi each number of the Beaufort scale prevailed.

Part II., the Monthly Weather Report. No change has been made in the tables included in the reports. From the commencement of 1910, the maps issued with the reports have been printed in blue on a black outline, and the intensity of the meteorological phenomena has been indicated on them by four gradations of blue stippling. The pictorial representation of the month's meteorology has become much more effective. The rainfall maps have been supplied as in previous years by the Director of the British Rainfall Organization. They are constructed from data from nearly 1,000 stations, and form a most important feature of the Reports.

Part III., "Meteorological Observations at Stations of the Second Order and at Anemograph Stations," has been issued regularly within six weeks of the close of each month. It contains daily observations at 20 Climatological Stations and an abstract of the tabulations from selected Anemograph Stations.

Part IV., "Hourly Readings at four Observatories in connexion with the Meteorological Office."

Arrears.—Some progress has been made in overtaking the arrears of the Annual Volumes of "Observations at Stations of the Second Order." The Volume for 1906 has been issued, and that for 1907 is now in the press.

Returns for Registrar-General.—Weekly and quarterly summaries have been prepared regularly for the Registrar-General of Births, Deaths, and Marriages for England and Wales and for Ireland. No change has been made in the form of these reports.

Seasons in the British Isles.—Some progress has been made with the preparation of the Report on the Seasons in the British Isles referred to on p. 29 of the report for last year, but it has been impossible to complete the work.

Climatology. Foreign and Colonial Stations.

A list of Foreign and Colonial Stations from which documents have been received in the course of the year is given in Appendix II., p. 89.

Among the additions to the list during the year under review may be mentioned a station started near Guayanaviėja, in Venezuela, by the Goldfields of Venezuela, Ltd. It is equipped as a normal climatological station, and in addition it possesses an autographic barograph and thermograph from which it is hoped that interesting information will be acquired regarding the diurnal variation of pressure and temperature in the interior of the South American Continent.

The returns received from all stations have been examined and summarised month by month.

Inquiries.

The inquiries dealt with in the Statistics and Library Branch during the year were 822, of which 305 were by letter and

the rest personal inquiries. The following table gives a classi fication of the inquiries with the corresponding figures for previou years :—

—	For Scientific or Commercial Purposes.	For Evidence in Legal Proceedings.	For Forecasts of Weather.	From Newspaper Correspondents for Special Information.	Miscellaneous.	Answered by Letter.	Answered Personally.
1903–4 ...	258	94	158	217	65	166	626
1904–5 ...	259	116	89	221	70	136	619
1905–6 ...	293	99	77	206	84	160	599
1906–7 ...	427	73	79	166	24	247	522
1907–8 ...	503	83	108	175	24	305	588
1908–9 ...	540	99	83	99	87	301	607
1909–10 ...	469	98	104	112	39	305	517

The inquiries included in the table under the heading " for fore casts of weather " are personal inquiries for information supple mentary to that contained in the official forecasts and exhibited a the entrance to the Office and in St. James's Park.

Exchange of Publications.

Exchanges of publications have been arranged with th following :—

Naturforscher Verein, Brünn.
International Agricultural Institute, Rome.
Observatorio de Cartuja, Granada.
Hydrographic Office, Stockholm.
The Mount Rose Observatory, Nevada.
The Observatory, Guanajuato (Mexico).

Library.

The subject card catalogue for the books added to the librar since the last list of additions was printed *in extenso*, as an appendi to the Report of the Meteorological Council for the year 1904–5, ha been brought up to date. The classification adopted is that of th International Catalogue of Scientific Literature. The additions t the library received during the past year, which have numbered up wards of 700 books and pamphlets, have been catalogued on thi system. The total number of books in the library is now 21,500.

In Appendix VII., p. 121, will be found (1) a list of persons an institutions from whom publications containing meteorological dat have been received during the last five years with a brief indicatio of the nature of the information given ; (2) a list of periodica containing memoirs on meteorological subjects, which are receive by the Office.

Among the most important additions to the library during th past year may be mentioned :—

La pluie en Belgique, par A. Lancaster ; Deutsche Südpola Expedition, 1901–1903, Teil 1 ; Rainfall of Rhodesia, b E. Goetz ; Meteorology, General Course, Vol. 1, by A Klossovsky (in Russian) ; Magnetic observations of th National Antarctic Expedition, 1901–1904 ; A discussion o

Australian meteorology, by W. J. S. Lockyer ; Croisière océanographique accomplie à bord de la Belgica dans la Mer du Grönland, 1905 ; Wissenschaftliche Ergebnisse der Schwedischen Südpolar Expedition, 1901–1903, Bd. 2, Lief. 1 u. 2.

Among those acquired by purchase have been :—

Manual de meteorolojía práctica, por R. Amengual ; Traité élémentaire de météorologie. 2e éd., par A. Angot ; The force of the wind, by H. Chatley ; Das Klimaproblem der geologischen Vergangenheit und historischen Gegenwart, von W. R. Eckardt ; Fighting the polar ice, by A. Fiala ; Die Luftelektrizität von A. Gockel ; Ergebnisse der Arbeiten des Samoa-Observatoriums, Nrs 1–3 ; Transactions of the International Union for Co-operation in Solar Research, Vol. 2 ; Physikalisch-chemische Tabellen, von H. Landolt und R. Börnstein ; Nouvelle méthode de prévision du temps, par G. Guilbert ; Die atmosphärische Elektrizität, von H. Mache und E. Schweidler ; Traité de géographie physique, par Emmanuel de Martonne ; Norwegian Aurora Polaris Expedition, 1902–1903, Vol. 1 ; Nearest the Pole, by R. E. Peary ; Meteorologische Optik, von J. M. Pernter und F. M. Exner ; Von Danckelmann's Mitteilungen von Forschungsreisenden und Gelehrten aus den Deutschen Schutzgebieten ; and a selection of the volumes of the International Catalogue of Scientific Literature.

The library is available for the use of students and others between the hours of 10 a.m. and 4 p.m. A number of persons have availed themselves of this accommodation.

IV.—Instruments Branch.

Supply of Instruments.

Supply to the Navy.—The number of instruments supplied to ships of the Royal Navy during the year was 810, as compared with 716 last year.

The Mercantile Marine.—To the Mercantile Marine 881 instruments were issued during the year, an increase of 240 compared with the number supplied in the previous year. 286 thermometers, 47 hydrometers, and 30 screens have been written off the books as broken, lost, or irrecoverable. A Stevenson Screen, with dry and wet bulb thermometers, and a Richard's Hair Hygrograph have been lent to Fleet-Surgeon Home, R.N., for hygrometrical experiments on board H.M.S. *Daedalus* at Bristol. Upon the recommendation of the Governor of the Falkland Islands instruments have also been lent to Messrs. Salvesen & Co. for use at Leith Harbour, S. Georgia.

Colonial Governments.—The number of instruments, charts for recording instruments, registers, &c., supplied on repayment through the Crown Agents for the Colonies, or direct to Colonial Governments was less than last year. The total number of instruments of all kinds amounted to 568 as compared with 2,772 in the preceding year, whilst charts for recording instruments, registers, and other books amounted to 13,409 as compared with 11,197.

Requisitions from the following Colonies were complied with :—

The Commonwealth of Australia (3).
Transvaal (4).
British South Africa (2).
Somaliland (2).
Fiji (2).
Hong Kong.
Gibraltar.
Perak (2).
South Nigeria (3).
Mauritius.
Gold Coast (2).
Cyprus (2).
Nyasaland.
Bechuanaland.

Local Authorities and Institutions.—Among these were included :—

Douglas Corporation.
Bexhill Corporation.
City of Coventry.
Hunstanton District Council.
Borough of Lancaster.
Mungret College, Limerick.
Derbyshire Education Committee.
Vienna Meteorological Bureau.
Northumberland Agricultural College.
Clyde Biological Station.
Oundle School.
Aspatria Agricultural College.
Victoria Park, Swansea.
Borough of Burnley.
Bradford Corporation.

Private Observers.—Instruments have also been supplied on repayment to a number of private stations in connexion with the Office, including the Royal Gardens at Balmoral, and at Abergeldie Castle ; the Inverliever Estate ; the Duke of Sutherland (four stations) ; Belvoir Castle ; Gordon Castle ; and Llaneugrad, Anglesey, for which station a complete set of instruments, including a Pressure-tube Anemometer, was supplied.

Telegraphic Reporting Stations.—The instrumental equipment of the telegraphic reporting stations has been maintained.

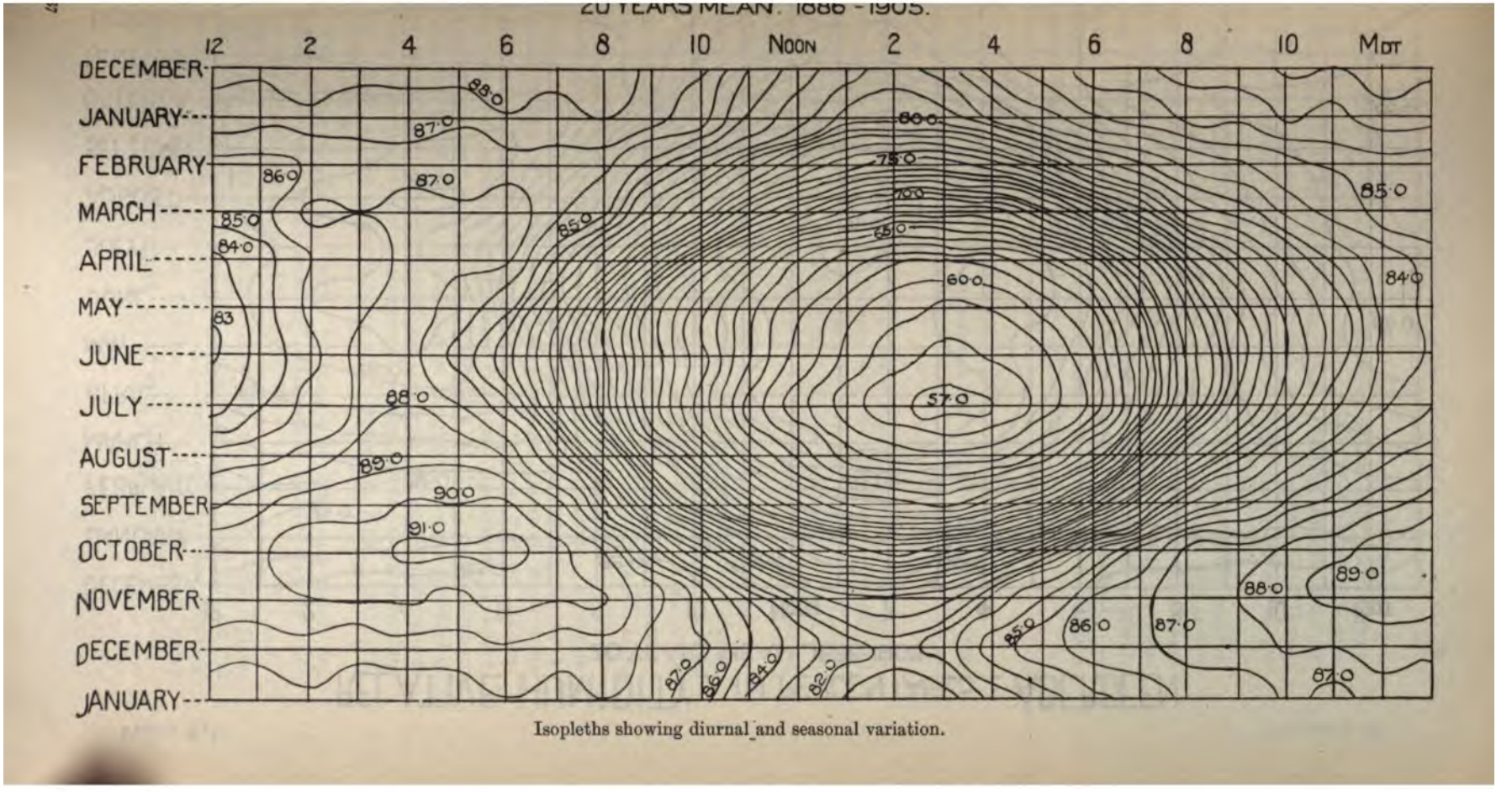
Storm Cones.—Storm warning cones have been replaced at 14 stations.

Fishery Barometers.—Inspectors of the Fisheries Board for Scotland, the Department of Agriculture and Technical Instruction in Ireland, and of the Board of Agriculture and Fisheries in England and Wales have continued to examine and report upon the barometers supplied for the use of fishermen in their respective districts. The stations supplied with these barometers now number 226, of which 64 are in England, 6 in Wales, 61 in Ireland, 90 in Scotland, 4 in the Isle of Man, and 1 in Jersey. The fishery barometers at West Mersea, Fleetwood, Moville Town, Carloway, and Boreray have been renewed.

Normal Meteorological Observatories, Anemograph and Sunshine Stations.

Observatories.—The work of the four observatories connected with the Office has been carried on as usual. As examples of results obtained from the hourly tabulation of self-recording instruments, diagrams representing the diurnal and seasonal variation of the humidity of the air at Kew and Aberdeen are here produced. (Plates VI. and VII.).

Anemograph Stations.—The number of anemograph stations which are maintained by the Office, or from which records are regularly

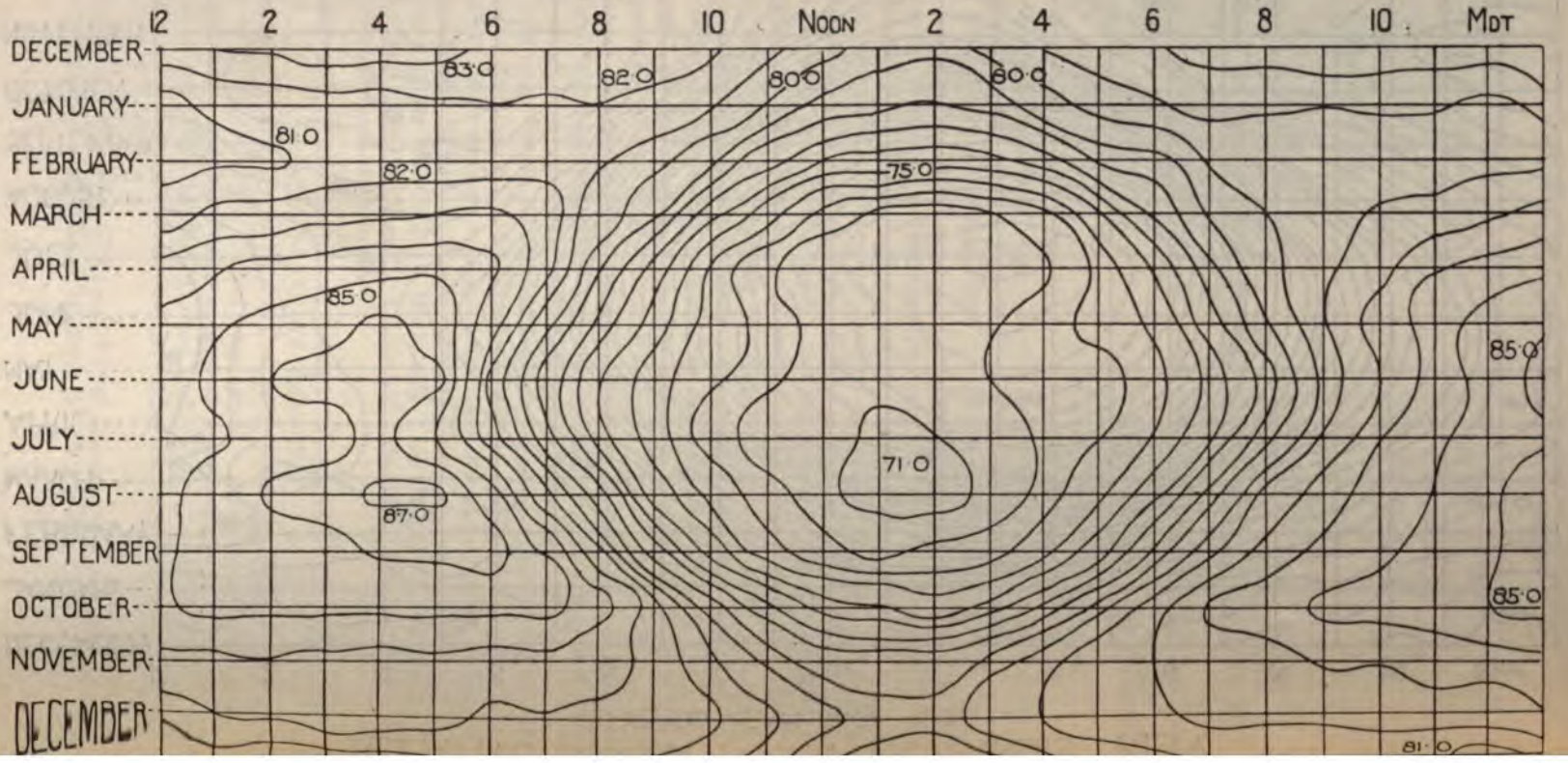


Isopleths showing diurnal and seasonal variation.

[*To face p.* 39.

RELATIVE HUMIDITY_ IN PERCENTAGES_ ABERDEEN

20 YEARS MEAN_1886-1905.



received at the Office, is now 26. The autograph records are tabulated week by week, so that the information they contain may become available for public use without delay. Information from a selection of them is published monthly with the observations at stations of the second order (British Meteorological Year Book, Part III.), and an annual summary of gales is published as an appendix to the Weekly Report (Year Book, Part I.).

Records of Sunshine.—The number of stations from which returns of "bright" sunshine are received continues to increase, and at the close of the year amounted to 151. With three exceptions they are all situated in the British Isles, the exceptions being Georgetown, British Guiana; the Falkland Islands; and Chin-kiang, China. The original records from 120 stations are retained in the Office, whilst those from the remainder are sent to the Office monthly for examination and are then returned.

V.—Investigation of the Upper Air.

The general scheme of operations at Pyrton Hill under the direction of Mr. W. H. Dines, F.R.S., has remained unchanged during the year.

International Co-operation.—The dates fixed by the International Commission for Scientific Aeronautics as days of international co-operation in 1909 were:—January 11, 12, 13; February 4; March 4; March 31, April 1, 2; May 6; June 3; June 30, July 1, 2; August 5; September 2; October 6, 7, 8; November 4; December 6, 7, 8, 9, 10, 11.

The last named constituted the special international week for which the Office arranged to conduct observations at Crinan, Argyllshire, as well as at Pyrton Hill, while the Joint Committee of the Royal Meteorological Society and the British Association for the Advancement of Science made arrangements for observations to be made at Dhulough, Co. Galway, by Captain C. H. Ley, late R.E., and at Barbados, by Professor d'Albuquerque, with the assistance of other officials of the Colonial Government. Throughout the year ended 31st December, 1909, the operations of the aerological station of Manchester University at Glossop Moor were continued with great activity and on June 2nd and 3rd, 25 balloons carrying self-recording instruments were sent up within 24 hours. Observations were also undertaken by Mr. C. J. P. Cave, at Ditcham Park, and by Mr. S. H. R. Salmon, at Brighton, who co-operated in the international scheme throughout the year. Special observations of clouds on the days of international ascents and the days preceding were made at the observatories of Greenwich, Kew, Aberdeen, and Valencia.

The observations are partly by means of kites and partly by balloons carrying self-recording instruments, partly also by pilot balloons which are observed from below.

Kite and Balloon Ascents at Pyrton Hill and Crinan.—At Pyrton Hill, kites carrying recording apparatus were sent up on 93 occasions during the year 1909. The only accidents that occurred were on January 18th, and October 15th, when kites broke away owing to the excessive strain on the wire in high winds.

Thirty-one balloons carrying instruments recording temperature and height were sent up from Pryton Hill, in 1909. Each balloon carried a card offering a reward of 5*s.* to the finder upon receipt of the instrument undamaged. In 14 cases out of the 31 the instrument was found and the reward claimed. Eight balloons were liberated from Crinan and three instruments were returned.

These proportions are unfortunately exceptionally small as compared with other stations.

Publication and Discussion of Results.—The results of all the kite and balloon ascents are published in the British Meteorological Year Book, Part I. (Weekly Weather Report). Observations made on the days appointed by the International Commission were forwarded to Professor Hergesell of Strassburg for publication also in international form along with the results obtained simultaneously in other countries.

The contribution to the publication of the results at Strassburg by international arrangement has been continued. The latest issue of the publication received before the close of the financial year, 31st March, 1910, was that for May, 1908.

The results as regards wind velocity for all the kite ascents in 1908 and 1909 have been plotted on diagrams to show the variation with height for the stratum of the atmosphere up to 1,000 metres (3,330 feet) above sea level, in order that information on the subject may be available for the use of aeronauts.

The Report on Apparatus and Methods in use at Pyrton Hill, noticed in last year's report, has already been referred to, pp. 6 and 12.

Nearly all the recording instruments for use at the co-operating stations of the British Isles during the year were made at Pyrton Hill.

VI.—Correspondence and Accounts Branch.

Appendix I., p. 42, shows the receipts and payments during the year ended 31st March, 1910. The amount voted by Parliament was £15,900, and the miscellaneous receipts amounted to £4,297 9*s.* 8*d.*

The following abstract shows approximately the net payments of this and the preceding year, together with the increase or decrease in 1909–10, as compared with the previous year :—

Net Expenditure.	1908–9.	1909–10.	Increase.	Decrease.
General Administration :	£	£	£	£
Director	1,000	1,000	—	—
Office Salaries	6,802	6,996	194	—
Rent, Fuel, and Lighting...	719	727	8	—
Alterations to premises and contingencies	74	—	—	74
Postage	493	588	95	—
Telegrams, &c.	1,474	1,615	141	—
Travelling Expenses ...	315	341	26	—
Instruments	381	531	150	—
Allowances to Observatories, &c.	3,183	3,174	—	9
Superannuation Account	1,191	1,092	—	99
Total ... ... £	15,632	16,064	614	182

The following notes explain the chief causes of variation in the year 1909–10.

The decrease under superannuation and part of the increase under salaries are due to changes in the amount invested, the lapse of a pension of £144 and the consequent revision of salaries.

The increase of £141 for telegrams shows only part of the charges incurred for wireless telegrams as the accounts rendered covered only eight months. The payments under this head are also reduced on account of an unusually low charge for storm warning telegrams (*see* p. 32).

The increase under instruments is due to the increase of office stock and to repayments outstanding at the close of the year.

W. N. SHAW,
Chairman.

July 6, 1910.

APPENDICES.

APPENDIX I.

ACCOUNT of RECEIPTS and PAYMENTS for the year ended 31st M 1910:—

RECEIPTS.	£ s. d.	£ s. d.	PAYMENTS.	£ s. d.	£
Balance from year 1908-09	—	2,327 10 4	Director	—	1,00
Parliamentary vote ..	—	15,000 0 0	OFFICE SALARIES:		
DEPARTMENTAL EXPENSES REPAID:			Clerical Staff, monthly	2,507 15 0	
			" "	4,347 6 10	
			" weekly..	230 6 8	
Forecasts, &c.	175 3 4		Messengers, " ..	305 4 6	7,39
Marine, Statistics, and Observatories	83 3 3		OFFICE EXPENSES:		
Instruments	136 7 6	394 14 1	Rent, Fuel, &c.	727 0 8	
INCIDENTAL EXPENSES REPAID:			Furniture, Fittings, &c.	123 4 11	
			Incidental	277 12 3	1,12
Forecasts, &c.	365 15 3		POSTAGE AND TELEGRAMS:		
Other Branches	98 18 6				
Stationery Office Account	53 4 4	517 18 1	General Postage ..	270 6 5	
TELEGRAPH CHARGES REPAID:			Postage of Daily Weather Reports ..	317 13 6	
			Telegrams, &c.	2,201 7 2	2,78
Home	139 18 1				
Telegrams sent abroad	446 8 11	586 7 0	TRAVELLING EXPENSES AND INSPECTIONS ..	—	34
INSTRUMENTS:					
Royal Navy	510 5 5				
Mercantile Marine, Stations, &c.	1,248 9 11	1,758 15 4	SUPERANNUATION ..	—	1,73
SUPERANNUATION ACCOUNT:			COSTS OF INSTRUMENTS:		
			Royal Navy	510 5 5	
Annuities	566 5 0		Mercantile Marine, Stations, &c.	1,779 14 10	2,2
Interest on Investment	52 19 0				
Income Tax returned ..	9 7 6	628 11 6	ALLOWANCES FOR OBSERVATORIES, OBSERVERS, &c. ..	—	3,2
LECTURES AND EXPERIMENTS	—	411 3 8	LECTURES AND EXPERIMENTS	—	3
			BALANCE:		
			Cash at Bank	2,153 0 4	
			" at Office	38 14 4	
			Advance for Inspections	15 0 0	2,2
		£22,525 0 0			£22,5

Note.—On 31st March, 1910, the amount of 2½ per cent. Annuities held for the provision of Superannuities was £2,761 1s. 3d.

APPENDIX II.

Statement of Provisions for the Supply of Information to the Public, 1910–11.

The Meteorological Office.

The office was established in 1854 as a department of the Board of Trade. From 1866 to 1877, with a Parliamentary Grant in Aid, it was under the management of a Committee, and from 1877 to 1905 under a Council appointed by the Royal Society. It is now under the control of a Director and Committee appointed by H.M. Treasury.

Kew Observatory and the Eskdalemuir Magnetic Observatory were transferred from the National Physical Laboratory, July 1, 1910, with subventions from the Royal Society. The Gassiot Committee appointed by the Royal Society consisting of the officers of the Society and eleven other members acts as an Advisory Committee for the work at the Observatories.

Director :
William Napier Shaw, LL.D., Sc.D., F.R.S.

Marine Superintendent :
Commander M. W. Campbell Hepworth, C.B., R.D., R.N.R.

Superintendent of Statistics :
R. G. K. Lempfert, M.A.

Superintendent of Instruments :
R. H. Curtis.

Chief Clerk and Cashier :
John A. Curtis.

Office Premises.

63, Victoria Street, S.W., till September 30th, 1910.
Exhibition Road, South Kensington, from October 1st, 1910.

Telegraphic address—"Weather, London."

Office hours and general arrangements.—The Office is open for general inquiries between the hours of 10 a.m. and 4 p.m. on week days (Saturdays, 1 p.m.), and for inquiries for forecasts and for information concerning the present weather conditions (*see* Section B, Telegraphic Information) from 8.30 a.m. to 8 p.m. on week days, and from 6 p.m. to 8 p.m. on Sundays.

Supply of Information and Charges.—The books and documents in the Office library, and the manuscript returns in the possession of the Office, may be consulted or copied at the Office, free of charge, by any person, by permission of the Director. Extracts from them

are supplied to any person making written application to the Director specifying precisely the details of the information required. For these extracts a charge is made to cover the cost of the time required for selecting and making them. The usual minimum charge is 5*s*. There are certain special exceptions with a smaller charge; a schedule of these will be sent on application.

The extracts will, if required, be attested by a sworn declaration before a Commissioner for Oaths, at a fee of £1 1*s*. (in addition to the charge of 1*s*. 6*d*. made by the Commissioner for Oaths). A special fee of from £2 2*s*. for each day's attendance is charged if a representative is required to attend in court in London with reference to the statements contained in the extracts supplied.

The facilities for the supply of information have been classified under the following heads :—

A. Marine Information.
B. Telegraphic Information.
   Daily Weather Reports, Forecasts and Storm Warnings.
C. Statistical Information.
   The British Meteorological Year Book—
   Part I., Weekly Weather Report.
   Part II., Monthly Weather Report.
   Part III., Observations at Stations of the Second Order and at Anemograph Stations.
   Part IV., Hourly Readings from the Self-Recording Instruments at Four Observatories.
   Unpublished Observations.
D. Information from land stations outside the British Isles.
E. The Library.
F. Supply of Instruments and Forms to Observers.
   Fishery Barometers.
G. Publication of Observations contributed by Volunteer Observers or by the Representatives of Local Authorities.
H. Regulations for the Supply of Information from Instruments belonging to the Meteorological Office by the Custodians of the Instruments.
I. Observatories and Stations in connexion with the Meteorological Office.
K. List of Publications.

A.—Marine Information.

General Information.—Observations have been forwarded to the Office, in special log books and registers, since 1855, by officers of the Royal Navy and the Mercantile Marine, and this valuable co-operation continues. In addition a large number of logs and remark books kept on board H.M. ships have been lent to the Office by the Admiralty, and by the large shipping firms, from time to time, for the purpose of extracting meteorological data. The information thus received is dealt with in various ways, and the results, which are published for the benefit of seamen and others, are indicated on pp. 95 to 96. Copies of these publications are presented from time to time to officers who contribute regular returns.

iformation is given to seamen, upon application to the Meteoro-
al Office, either in person or by letter, with respect to the
orological conditions likely to prevail along a proposed route,
r for sailing vessels or for steamships.

onthly Charts.—Meteorological Charts of the North Atlantic
Mediterranean have appeared each month since 1901, and a
lar monthly series for the Indian Ocean and Red Sea since
, 1906. On the face of these charts there are graphically
esented, for the respective ocean areas, the normal winds,
ents, distribution of atmospheric pressure, and temperature of
and sea surface, the magnetic variation, and the best routes
sailing vessels and steamships, according to the season. On the
th Atlantic charts, in addition, there are given the average
ts of trade winds, gales, fog, and ice, mean paths of centres of
lones, storm signals, and wireless telegraphy stations ; time
igh water at Dover ; recent reports of ice, including, in the
ths of April, May, June, November and December, the
st intelligence, by cablegram, from the Signal Service of
ada, in regard to the state of the ice in the Gulf of
Lawrence and its approaches. On the Indian Ocean
rts there are given the average limits of trade winds and
soons, surface temperature and currents near Cape Guardafui ;
rmation relative to the meteorology of the Red Sea, and
ks of cyclones in the Indian Ocean and the Arabian
. During the south-west monsoon season, important cable
ces from the Director General of Indian Observatories, with
ect to the state of the weather conditions in the Arabian Sea
Bay of Bengal are also given.

**aily Synoptic Charts of the N. Atlantic. Weekly Charts of Sea
perature.**—Since April, 1910, the charts of the North Atlantic
Mediterranean have been issued in weekly instalments. This
ngement affords an opportunity of including on the backs of the
rts seven maps giving the distribution of pressure and other
ients on each day of the week ended on the day before the issue
he chart, over Europe, the North Atlantic, and the East of
erica. The charts are prepared from reports received from
l stations in Europe in connection with the telegraphic work of
Office, from reports from ships of His Majesty's navy and the
cantile marine, received by wireless telegraphy and from the
rmation for American stations published in the Bulletin Inter-
onal, issued by the Bureau Central Météorologique in Paris.
e charts are also shown giving for successive periods of seven
s the most recent information regarding the temperature of the
water in the North Atlantic. The most recent information as
he occurrence of ice both in the Gulf of St. Lawrence and in
open ocean, and as to derelicts is also included.

pecial Articles.—The special features of the current issue of the
eorological Charts of the North Atlantic and Mediterranean,
ude monthly inset charts showing the percentages of fog, mist,
gales over the North Atlantic for each month ; the latest
rmation to hand up to the time of going to press each month
respect to ice in the Southern Ocean.

On the backs of the Meteorological Charts of the Indian Ocean
Red Sea information has been given relative to various subjects

which are of importance to navigators and others, including a com
prehensive account of Southern Ocean ice; results of meteorologic
observations on the shores of the Red Sea; a monthly statement
currents experienced by the cable steamer *Sherard Osborn* near t
East Coast of Africa between 1906 and 1908; and cyclone trac
of the South Indian Ocean.

Terms of Subscription.—Copies of both series of charts may
obtained from the Superintendents of the Mercantile Mari
Offices at the principal ports of the United Kingdom, by capta
and officers of merchant ships, price 6*d.* each. They may also
purchased from the Admiralty agents for the sale of charts, a
from the agents for His Majesty's Stationery Office at Edinbur
and at Dublin, at the rate of 5*s.* for an annual series of 12 cha
or 6*d.* for each chart, in addition to the cost of transmission. T
Indian Ocean Charts are also obtainable on similar or equival
terms from Messrs. James Murray and Company, at Calcutta, a
at the shipping offices at Bombay and Madras. Captains a
officers who co-operate with the Meteorological Office by send
regular reports receive copies of the Monthly Meteorological Cha
free.

Dates of Issue of the Charts.—The weekly instalments of
Monthly Charts of the North Atlantic and Mediterranean app
on Thursday of each week. The Charts of the Indian Ocean
published on the 1st day of the month preceding that to which
information refers.

Instruments for Observers.—Subject to certain regulations
instruments necessary for the keeping of a Meteorological L
Book will be lent by the Office to the captains of British ships v
undertake to make regular four-hourly records during their voya
to and from foreign ports, enter them in the specially arranged
book provided for the purpose, and return the latter, on complet
to the Marine Superintendent. A rough book for entering up
observations when taken, is also supplied, and this becomes
property of the captain for future reference. The set of inst
ments lent to captains by the Meteorological Office comprises o
mercury barometer, six thermometers, with screen, for register
the shade temperature of the external air and the temperature
the sea surface, and four hydrometers. The expenses incurr
by the co-operating captains with respect to postage of log boo
and the transit of instruments, are borne by the Meteorologic
Office.

The ships are supplied either directly from the Meteorologic
Office or through the following agents :—

Cardiff—Captain J. Weir, Examiner of Masters and Mat
Local Marine Board.

Dundee.

Glasgow—Messrs. D. McGregor & Co., Ltd., 57, Bothw
Street.

Greenock—Messrs. D. McGregor & Co., Ltd., 32, Brym
Street.

Hull—Captain W. Ellery, Examiner of Masters and Mat
Mercantile Marine Office.

Liverpool—Commander F. M. Sergeant, R.N.R., Chief Examiner and Secretary, Local Marine Board, Canning Place (E.).
Southampton—Captain D. Forbes, 169, High Street.
Sunderland—Messrs. J. J. Wilson & Son, 18, Hudson Road.

Sets of instruments are kept in working order at the Office in London, and at each agency, for the purpose of instructing observers in the method of observation.

B.—Telegraphic Information.

Daily Weather Reports. Forecasts and Storm Warnings.

Between 7.15 a.m. and 9.30 a.m. telegraphic messages are received daily, reporting meteorological observations at 29 stations (marked T in list of stations, pp. 68 to 86) in the British Isles, chiefly on the coast, at 39 stations (p. 87) on the Continent of Europe including Gibraltar and at the Azores, at five stations in Iceland and one in the Færöe Islands. The observations are now made at 7 a.m. at all stations, except Birr Castle, Oxford, Lisbon, and the Azores. A certain number of stations report evening observations (6 p.m.), also by telegram, and those that do not report in the evening include the evening observations with the following morning reports, so that a complete schedule of morning and evening observations is drawn up daily. The information refers to the readings of the barometer, dry and wet bulb thermometers, maximum and minimum thermometers, rainfall, and in some cases, sunshine, with estimates of the direction and force of the wind, and reports of the weather and state of the sea. The observations received from Iceland give only the readings of the barometer and the dry bulb thermometer, the direction and force of the wind, and the state of the weather.

These reports are supplemented by a number of additional observations made at various stations in the United Kingdom, and sent either by telegram or by post, by private persons or local officials. Moreover, the "Bulletin International" published in Paris, reproducing meteorological telegrams from the whole of Europe, is received by post on the morning of the day after publication, and supplements the information previously received in the Office by telegram.

Through the courtesy of the Lords Commissioners of the Admiralty occasional reports of observations at sea off our southern and western coasts are transmitted by wireless telegraphy from the ships of H.M. Navy. Wireless reports are also received almost daily from ocean liners crossing the Atlantic.

The telegraphic information is tabulated and charted by about 9 a.m. for the morning observations, and 7 p.m. for the evening ones. A general report is then drawn up, and forecasts of the weather, **the twenty-four hours following the next noon, or midnight, as the case may be**, are formulated; a note as to the further outlook is added if the meteorological conditions are such as to justify an anticipation for more than twenty-four hours ahead.

At a selection of stations additional observations are taken and telegraphed to the Office at 1 p.m., and occasionally modifications are made in the morning forecasts as a result of these observations. This information is usually available by 3 p.m.

Forecast Districts.—For the purposes of forecasts of weather t region of the British Isles is divided into land districts and s districts, as indicated in the accompanying map.

FORECAST DISTRICTS.

LAND.*

0. SCOTLAND, NORTH. (*a.*) Islands. (*b.*) Mainland.
1. SCOTLAND, EAST.
2. ENGLAND, NORTH-EAST. (*a.*) North. (*b.*) South.
3. ENGLAND, EAST.
4. MIDLAND COUNTIES. (*a.*) East. (*b.*) West.
5. ENGLAND, SOUTH-EAST.
6. (*a.*) SCOTLAND, WEST. (*b.*) ISLE OF MAN.
7. (*a.*) ENGLAND, N.W. (*b.*) NORTH WALES.
8. (*a.*) SOUTH WALES. (*b.*) ENGLAND, S.W.
9. IRELAND, NORTH. (*a.*) West. (*b.*) East.
10. IRELAND, SOUTH. (*a.*) East. (*b.*) West.
11. MOUTH OF CHANNEL and Bay of Biscay.

SEA.

A. SHETLAND AND THE NAZE.
B. GREAT FISHERY AND DOGG BANKS.
C. NORTH SEA, North of the Wash.
D. NORTH SEA, South of the Wash.
E. STRAITS OF DOVER.
F. ENGLISH CHANNEL, East of the I of Wight.
G. ENGLISH CHANNEL, West of t Isle of Wight.
H. BRISTOL CHANNEL.
J. ST. GEORGE'S CHANNEL.
K. IRISH SEA.
L. NORTH CHANNEL.
M. THE MINCH.

* For the grouping of the counties to represent approximately the forec districts, *see* List of Stations, pp. 68 to 86.

The Distribution of Forecasts and Telegraphic Intelligence.

Daily Weather Report.—A Daily Weather Report, which includes a transcript of the observations for the day, with some of those for the previous day, illustrative charts, descriptive remarks on the state of the weather, and the weather prospects for the several districts of the British Isles and for the Bay of Biscay, is prepared for press and sent to the lithographers at 11 a.m. daily, except on Sundays and Bank Holidays. It is ready for issue by 1 p.m., and is then delivered by hand or posted by book post at 1.30 p.m. to those addresses which can be reached in the regular course of post on the same day. Copies for those who are outside this limit are posted by the evening mails.

Subscriptions.—The Daily Weather Report may be obtained on payment in advance at the Meteorological Office of the cost of transmission (postage and wrappers). The subscription for this service, if for not less than a quarter of a year ending at the official quarter days, *e.g.*, March 31, June 30, &c., is at the rate of £1 per annum for delivery by book post, £2 for delivery, where feasible, by hand. Copies for other periods than the official quarters of a year are charged at the rate of 2*s.* for a complete month and 1*d.* per copy for periods of less than a month. Single copies, price 1*d.* each, can be obtained after 2 p.m. on the day of issue at the Office, and at the railway bookstalls at the following terminus stations:—Victoria (L.B.S.C., and S.E. & C. Railways), Charing Cross, King's Cross, St. Pancras, Euston.

Reports for Educational Purposes.—By arrangement with H.M. Stationery Office, upon giving the necessary notice, additional copies of the Daily Weather Report for one day, or a succession of days, will be printed off and supplied for class use at the rate of 7*d.* for 10 copies, exclusive of postage.

Surplus copies of charts prepared for exhibition, or of back numbers of the Daily Report, are available for educational purposes upon application to the Director. No charge is made for this service, but the cost of postage must be defrayed.

Reports for the Press.—Special advance copies of the descriptive remarks on the state of the weather and forecasts, based upon the morning or evening observations, are prepared at 10 a.m. and 7 p.m. respectively, and supplied gratis to the representative of any newspaper or press agency calling for them at the Office at the hours named.

As far as practicable the Director, upon application, will make arrangements for the transcription of the whole or a selection of the morning or evening telegraphic reports, to be sent by telegraph, in code form, to newspapers or public associations desiring to make use of this means of accelerating the distribution of the latest information about the weather. The special terms for this service can be obtained on application to the Office.

The Director will also arrange for the supply of daily or weekly reports of the state of the weather, in special form, upon terms which may be had upon application at the Office personally or by letter.

Public Exhibition.—The latest reports and forecasts for the la districts and for the Western Channel and Bay of Biscay, wit map, are exhibited as early as possible, for the information of t public, at the entrance to the Office, and, by the courtesy of H Majesty's Office of Works, in St. James's Park, opposite t Horse Guards. Abbreviated reports for a few coast stations a displayed in the street, on the balcony of the Office. Foreca for the sea districts, with notes on the probable tides, are exhibi on a screen outside the Inquiry Branch of the Office.

Typewritten copies of the morning forecasts for all districts a ready at 10 a.m., and are distributed by hand to clubs and societ situated in or near Pall Mall at a charge of 10*s.* per annum. Th are sent by post at a charge of 2*s.* 6*d.* per official quarter or a part thereof, in addition to the cost of transmission. Copies of t evening forecasts are sent by post for a similar charge.

Forecasts for a single district will be sent regularly by telegra to public bodies for exhibition without any charge beyond the co of the telegrams, and to private persons at an additional charge 3*d.* per telegram for a forecast for a single district, and 6*d.* for tw or more districts.

Written Special Forecasts.—A written copy of the latest foreca for a single district can be obtained at the Office between 9.30 a.m and 8 p.m. upon payment of 6*d.* A written copy of the late information in possession of the Office as to the state of the weath in any district of the British Isles, and for the neighbouring par of the continent of Europe, can also be obtained.

Inquiries by Telegraph.—By arrangement with H.M. Postmaste General (*see* the Post Office Guide, "Meteorological Telegrams" the latest information as to the state of the weather in vario parts of the United Kingdom, or the Continent, and forecasts f one day in advance, can be obtained from the Meteorologic Office, upon payment at any Postal Telegraph Office of a fee 6*d.* in addition to the cost of a telegram of inquiry address "Weather, London," and of the reply. Ten words, in addition the address, must be allowed for the reply.

Telegrams of inquiry should state the nature of the informati required, and the name and address to which the information is be sent, as in the following examples :—

To "Weather, London."

Latest Information from [*Straits of Dover*].

or,

Latest Forecast for [*Forfarshire*].

or,

Next forecast for [*Dublin*].

From (Name), (Address).

The latest information for any district, or the latest foreca will be sent by telegraph to any address if a request be received post stating when the information or forecast is to be sent, a enclosing 6*d. in addition to the cost of a telegram*, allowing ten wo in addition to the address. It should be noted that forecasts a prepared for issue at 10 a.m. and 7.30 p.m. To avoid delay, lett

of request for telegraphic information or forecasts should be marked on the outside "Forecast Branch."

Inquiries by Telephone.—Forecasts will be sent in reply to inquiries by telephone if a sum has been previously deposited with the Office to cover the authorised charges for departmental expenses. Further information as to the service by telephone can be obtained on application at the Office.*

Harvest Forecasts.—Arrangements have been made for a special service of afternoon reports during the season of the Hay and Corn Harvests (June 1st to September 30th), with a view to a special series of forecasts daily (Sundays excepted) at 2.30 p.m. The forecasts for any district are supplied by telegraph to agriculturists and others upon prepayment of the cost of the telegrams (twelve words daily in addition to the address) for the period during which the forecasts are required. Forms of application for these forecasts can be obtained at the Office.

The Postmaster-General has sanctioned the exhibition of Forecasts at Local Post Offices, provided space is available, if the persons to whom they are addressed desire them to be so exhibited.

Notification of Spell of Settled Weather.—The Office is prepared to send notification by telegram when the conditions appear favourable for a spell of settled fine weather. The notification will take the form of a forecast covering a period of not less than two days following the date of issue. Those who wish this notification to be sent must deposit a fee of 2*s.* 6*d.*, which includes the cost of the telegram. The deposit must be repeated if a second notification is required.

Storm Warnings.

The Office issues notices of threatening atmospherical disturbances on or near the coasts of the British Islands (free of charge) to ports and fishing stations recommended by responsible local authorities.

Storm Signals.—The fact that one of these notices has been received at any station is made known by hoisting a black canvas cone, 3 feet high, and 3 feet wide at base, which has the appearance of a triangle when hoisted. The telegram directing the cone to be hoisted is exhibited near the signal staff.

At dusk, whenever a signal ought to be flying if it were daylight, a night signal, consisting of three lanterns hung on a triangular frame, should be hoisted in place of the cone.

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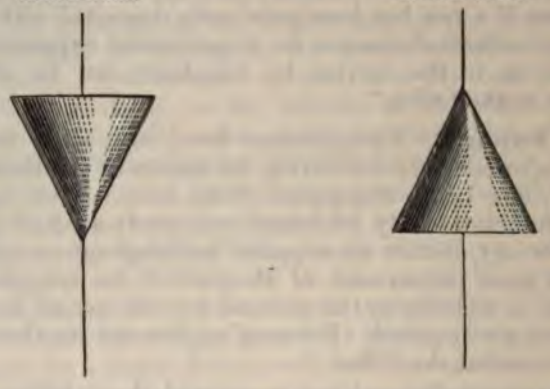
* *Note.*—A forecast is a statement of the weather to be expected during the period to which the forecast refers, arranged, generally speaking, as follows:—Direction and force of the wind, state of the sky as regards cloud, prospect of rain, snow, or thunder, temperature, and, in the case of the sea districts, sea disturbance. For example, the forecast for a land district referring to the twenty-four hours from the following noon or midnight, according to the time of issue, may read: "Light south-easterly to easterly winds; fine at first, cloudy later, with local thunder showers. Becoming cooler." The forecast for a sea district may read: "Strong southerly and south westerly winds, with squally, showery weather and a rough sea."

Storm Signals Exhibited.

Day Signals.

South Cone. North Cone.



Night Signals

(Instead of the cone), Lights in Triangle.

For South Cone. For North Cone.

Three lanterns and one yard, 4 ft. long, will be sufficient.

The "*South*" *Cone* (point downwards) is hoisted for gales and strong winds—

From S.E., veering to S.W., W., or N.W.,
„ S.W., veering to W. or N.W.,
„ W., veering to N.W.,

and also from E., veering to S. or S.W.

The "*North*" *Cone* (point upwards) is hoisted for gales and strong winds—

From S.E., E., or N.E., backing to N.,
„ N.W., veering to N., N.E., or E.,
„ N., veering to N.E. or E.,
„ N.E., veering to E.

At dusk, whenever a signal ought to be flying if it were daylight, a *Night Signal*, consisting of three lanterns hung on a triangular frame, may be hoisted in place of the cone, point downwards (for South Cone), or point upwards (for North Cone), as the case may be. The lamps should be kept burning until, say, 9 or 10 o'clock.

Gales sometimes follow one another in quick succession. An order to "Keep up" will be sent if the warning is to be continued beyond the ordinary limits ; and an order to "Lower" will be sent if there

is reason to believe that danger is over before the regular time has lapsed.

If a gale has commenced before warnings are issued, notice to hoist the cone will still be sent if it is expected that the gale will continue, or increase in force, but not otherwise.

Sudden Shifts of Wind.—A Southerly gale often *veers* quickly to a point North of West, but a gale from the Eastward is more likely to *back* to the *Northward*.

It is important to bear this in mind, especially in anchorages or harbours exposed to the Northward.

Meaning of Signal.—The signal shows that an atmospheric disturbance is in existence which will *probably* cause a gale, from the quarter indicated, within a distance of (say) 50 miles of the place where the signal is hoisted. The Signal Station itself is sometimes comparatively sheltered. The meaning of the signal is simply, "Look out! Bad weather of such and such a character is probably approaching you."

The warning is intended to continue from the time the telegram leaves the Meteorological Office until 8 o'clock on the evening of the following day.

The Meteorological Office supplies the canvas cone and a card providing space for the exhibition of the telegrams and giving information as to the meaning of the warnings, but it does not supply the lanterns for night signals. In all cases the local authorities must undertake the charges incidental to the hoisting of the signal, such as flagstaff and gear, oil, &c., and also as to the keeping of the apparatus in repair.

List of Storm Signal Stations.

The following is a List of Stations to which Storm-warning telegrams are sent :—

Northern.

Scotland, N.E.—Lerwick, Scalloway, *Dunrossness, Sumburgh Head L.H., Fair Isle L.H., Noup Head L.H., Stromness, Kirkwall, Cantick Head L.H., Thurso, Dunnet Head, Wick, Tarbet Ness L.H., Cromarty, Avoch, Inverness, Nairn, Burghead, Lossiemouth, Buckie, †Port Knockie, Cullen, Portsoy, Banff, Fraserburgh, Peterhead, †Aberdeen, Girdleness L.H.

Scotland, E.—Stonehaven, Montrose, Scurdy Ness L.H., Broughty Ferry, Dundee, St. Andrews, Anstruther, Pittenweem, Buckhaven, Methil, Wemyss West, Burntisland, *Grangemouth, Bo'ness, Granton, *Newhaven, †Leith, Fisherrow, *Dunbar, Cockburnspath, St. Abb's Head, Eyemouth.

Scotland, N.W.—Cape Wrath L.H., Stourhead L.H., Port of Ness, Stornoway, Island Glass L.H., Portnaguran.

Scotland, W.—*Glasgow, Greenock, Rothesay, Lamlash, Carradale, Campbeltown, Mull of Cantire L.H., Rhuvaal L.H., Rhinns of Islay L.H., Ardrossan, Girvan, Ballantrae, Cairn Ryan, Corsewall Point L.H., Mull of Galloway L.H.

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* Telegrams only exhibited.

† Arrangements made for showing signals or illuminating the cone at night.

WESTERN.

Ireland, S.—Tuskar L.H., New Ross, Dunmore East, Du
van, Helvick Head, Minehead L.H., Youghal, Queenstown,
Passage, Kinsale, Kinsale (Old Head), Galley Head L.H., C
townshend, Fastnet Rock L.H., Brow Head, Dingle, T
†Limerick, Loophead L.H., Galway.

Ireland, N.—Killybegs L.H., Tory Island L.H., Lough S
L.H., Rathmullen, Malin Head, Mulroy, Portrush, Port E
trae, Ballycastle.

Irish Sea.—Belfast, Donaghadee, Howth, Kingstown, Po
Ayre, Ramsey, Douglas, Silloth, Maryport, Workington, W
haven, Barrow, Walney Island L.H., Morecambe, Feet
Blackpool, Lytham, Preston, †Southport, Formby, Live
Runcorn, New Brighton, Hoylake, New Ferry, Penmaen
Port Penrhyn, Point Lynas L.H., Holyhead, South Stack
Carnarvon, Port Dinorwic.

St. George's Channel.—Aberystwyth, Smalls L.H., *Milfor

Bristol Channel.—Caldy L.H., †Tenby, Pembrey, Lla
Swansea, Briton Ferry, Porthcawl, Nash L.H., Penarth, C
(Bute Dock and Barry Dock), Newport, Weston-super-
Burnham, *Bridgwater, Ilfracombe, Bull Point L.H., *
staple, Appledore, Hartland Point L.H., Lundy Island, Port
Newquay, Godrevy L.H., Hayle, St. Ives, St. Sennen, N
West, Penzance.

SOUTHERN.

England, S.W.—Scilly, the Lizard, Falmouth, Pendennis C
Mevagissey, Plymouth (*Millbay Docks), Devonport (Mount
and the †Dockyard), Prawle Point, Salcombe (2 stations), T
mouth, Exmouth.

England, S.—Guernsey, Jersey (St. Helier's), Portland
Weymouth, Anvil Point L.H., Poole, Hirst Castle L.H., S
ampton, Yarmouth (I. of W.), Cowes, Ryde, St. Catherine's
Portsmouth (Dockyard and Noman's Fort), Littlehan
Brighton, †Newhaven.

England, S.E.—Beachy Head, Eastbourne, †Hastings,
Sandgate, Dover, Deal, Ramsgate, Margate, Faversham, Shee
Chatham, Greenhithe.

EASTERN.

England, N.E.—Berwick-on-Tweed, Tynemouth, South Sh
Souter Point L.H., Sunderland, Hartlepool, †Middlesb
Redcar, Whitby, Filey, Flamborough, Bridlington, Hull, *
Grimsby, Boston.

England, E.—*Sutton Bridge, Lynn, Sheringham, C
Great Yarmouth, Gorleston, Southwold, Orford Ness
Ipswich, Harwich, Gunfleet L.H., West Mersea.

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* Telegrams only exhibited.

† Arrangements made for showing signals or illuminating the cone at n

C.—Statistical Information.

The British Meteorological Year Book.

Terms of Subscription.—The Statistical Publications of the Office have been grouped together under the general title "British Meteorological Year Book." For 1909 the Year Book consists of four parts, as follows :—

Part I.—The Weekly Weather Report. Issued on Thursday of each week. Price 6*d.* per number. Annual subscription (which includes the Monthly Weather Report, *see* below) 30*s.* postage paid. The appendices to the report can be obtained separately, price from 4*d.* each.

Part II.—The Monthly Weather Report with an annual summary. Issued on the 27th of each month as supplement to the Weekly Weather Report. Price 6*d.* each issue.

Part III.—Observations at Stations of the Second Order and at Anemograph Stations. Issued in monthly parts, within about six weeks of the close of each month. Price 1*s.* 6*d.* each issue. Annual Volume consisting of 12 monthly numbers with Introduction, Title Page and Map, 16*s.*

Part IV.—Hourly Readings at the four Observatories in Connexion with the Meteorological Office. Issued in monthly sections for each observatory within about six weeks of the close of each month. Price 6*d.* each section. Annual Volume with Title Page and Introduction, 25*s.*

Parts I. and II. of the Year Book can be purchased either directly or through any bookseller from the Agents to H.M. Stationery Office, Messrs. Wyman & Sons, Fetter Lane, E.C., Oliver and Boyd, Edinburgh and E. Ponsonby, 116, Grafton Street, Dublin. Parts III. and IV. are on sale at the Meteorological Office only. (For terms of subscription to the Daily Weather Report, *see* p. 49.)

Copies of the British Meteorological Year Book are sent to the following public libraries and private institutions in London, viz. :—

The British Museum ; Guildhall Library ; Imperial Institute ; Royal Botanic Gardens* ; Royal Society ; Royal Astronomical Society ; Royal Meteorological Society ; The Society of Arts* ; Lloyd's ; Royal United Service Institution ; London Institution ; Solar Physics Observatory ; Royal Institution ; General Register Office* ; Royal Observatory, Greenwich ; Royal Naval College, Greenwich ; Board of Education (Victoria and Albert Museum) ; Institution of Civil Engineers ; Local Government Board* ; Board of Trade* ; Board of Agriculture and Fisheries† ; The Admiralty† ; British Balneological and Climatological Society* ; The Metropolitan Water Board ; British Rainfall Organization ; Kew Observatory.

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* Parts I. and II. only. † Parts I., II., and III. only.

Copies are also filed at the public libraries at Aberystwyth, Birmingham, Bradford, Brighton, Darwen, Dumfries, Guernsey (Guille-Alles Library), Huddersfield, Liverpool, Middlesbrough, Penzance, Preston, Rhyl, Stamford, Shrewsbury, Swansea, Southend, Great Yarmouth, as well as at the University Libraries of Edinburgh; Trinity College, Dublin; Queen's College, Belfast; Birmingham; Leeds; the Radcliffe Observatory, Oxford, and the Philosophical Library, Cambridge.

Part I.—Weekly Weather Report with Appendices.

Weekly Summaries.—The Weekly Weather Report gives a summary of the weather of the week ending with Saturday, intended principally for agricultural and sanitary purposes.

An advance copy of the MS. of the Weekly Report is prepared on Tuesday in each week, and is supplied free of charge to newspapers.

A division of the country into twelve districts, which are identical with the forecast districts of the Daily Weather Report, is adopted. The districts are further grouped into extreme north, eastern and western districts, and extreme south (islands in the English Channel).

In its present form the Report contains:—

I.—General remarks on the meteorological conditions of the week, with a table describing in words the divergence of the warmth, rainfall, and sunshine experienced in each district from the average for the district for the time of the year.

II.—A table summarising in numerical form the conditions of temperature, rainfall, and sunshine for each district for the week, the current season, and the calendar year.

III.—A table containing the data from stations from which the values for districts are calculated.

IV.—A table containing information for selected stations concerning the minimum temperature on the grass and the temperature in the ground.

V.—A table giving information of the temperature of the sea-water at a selection of stations on the coasts of the British Isles.

VI.—A series of maps showing the distribution of pressure and wind over Europe and Iceland at 7 a.m. and 6 p.m. on each day, and the temperature, weather, and sea disturbances at 7 a.m. each day. The maps for each day are accompanied by a brief account of the distribution of weather for that day, and the changes which have taken place.

VII.—A table giving the results of observations of the upper air taken by means of kites and balloons. These results include particulars as to temperature, humidity, and wind (direction and force) at various levels.

The weekly statistical tables of values for districts have been prepared in their present form since 1878.

For the maps and descriptive account, the daily telegraphic reports are used, and are supplemented by the information contained in the "Bulletin International" already referred to (p. 47), so that the area represented is much larger than that covered by the Daily Weather Report.

For the statistical summaries, the information from the telegraphic reporting stations in the British Isles is supplemented by returns of daily observations supplied by volunteer observers from over 100 other stations. Of these 27 supply only the daily amounts of bright sunshine.

Appendices.—Subscribers for the Weekly Weather Report receive the following appendices :—

(*a.*) An *Appendix*, issued quarterly and annually, containing *quarterly and annual summaries of the rainfall, mean temperatures* and *bright sunshine* of each district for each year since 1878.

(*b.*) An *Appendix*, issued annually, giving *weekly and progressive totals* of rain-days, rainfall, accumulated temperature, and duration of sunshine with percentage of its possible amount, for the several districts.

(*c.*) An *Appendix*, issued annually, giving a summary of the *gales* experienced at anemograph stations in connexion with the Office.

(*d.*) An *Appendix* computed every fifth year, giving the *weekly values* of the different elements in the *five years*, and for the whole period, since 1881.

(*e.*) An *Appendix*, which is also prepared every fifth year, giving the *monthly averages* of rainfall, rain-days, maximum temperature, minimum temperature, mean temperature, duration of bright sunshine and percentage of possible bright sunshine, for as many as possible of the stations included in the Weekly Weather Report.

Part II. Monthly Weather Report and Annual Summary.

Monthly and Annual Summaries.—The Monthly Weather Report is issued as a supplement to the Weekly Weather Report. Each number contains (1) a general account of the weather for the month ; (2) a complete summary of the observations at the Telegraphic Reporting Stations, and at Normal Climatological Stations ; (3) a summary of maximum and minimum temperature, temperature in the ground and on the grass, rainfall, and sunshine at auxiliary Climatological Stations ; (4) the differences, where possible, from the average pressure, temperature, rainfall and sunshine ; (5) four maps showing the monthly distribution of barometer and wind, the movements of barometric depressions, the distribution of mean temperature, and the distribution of bright sunshine ; (6) a full-page map prepared by the Director of the British Rainfall Organization from data from nearly 1,000 stations showing the distribution of Precipitation.

The number for March, 1910, contains tables of results for 209 stations, namely :—23 telegraphic stations and 83 normal climatological stations, together with a summary of temperature, rainfall, and sunshine, or one or more of these elements, at 112 other stations. For 13 of the 23 telegraphic stations summaries are given for the

hours 7 a.m., 1 p.m., 9 p.m., a combination which entitles the station to rank as normal climatological stations.

An Annual Summary on similar lines has been added since the year 1904.

Part III. Meteorological Observations at Stations of the Second Order and at Anemograph Stations.

Daily Readings.—This publication contains daily values for 2 stations in the British Islands of observations made at stations of the second order at 9 a.m. and 9 p.m. Particulars of the heading under which observations are taken are given on p. 65. The publication also contains daily summaries of the records from 12 stations equipped with autographic anemometers.

A similar publication, but containing no data from anemograph stations, has been issued in annual volumes since 1876. These annual volumes contain, in addition, monthly and annual summaries for a large number of stations which are now included in the Monthly Weather Report. The volume for the year 1907 has not yet been published. The prices of the volumes vary from 20*s.* to 35*s.*

Part IV. Hourly Readings obtained from the Self-Recording Instruments at Four Observatories in connexion with the Meteorological Office.

This publication contains hourly values of pressure, dry bulb temperature, humidity, wind direction and velocity, rainfall and bright sunshine for each of the four observatories—Valencia, Aberdeen, Falmouth, Kew. Particulars of the corresponding publications for previous years are given on p. 94.

Unpublished Observations.

The Office also receives, in return for an annual grant, duplicates of the curves from the autographic instruments at Glasgow* and Stonyhurst* observatories, and the tabulations of these curves are available if required.

Anemographic records are received from Alnwick Castle, Armagh, Brighton, Deerness,* Dover,* Dublin, Falmouth (Pendennis Castle), Fleetwood, Holyhead,* Kingstown,* Llaneugrad, North Shields,* Plymouth,* Pyrton Hill, Roche's Point,* Scilly, Shoeburyness, Southport,* Warlingham, and Yarmouth.*

The names of all stations in the British Isles from which information of any kind is received, and a statement of the order of the stations and of the publication for which the returns are prepared are given in the lists on pp. 68 to 86. All the records are available for the use of the public on the conditions set forth on p. 43.

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* Results from anemographs at these stations are now published in "Observations at Stations of the Second Order and at Anemograph Stations."

D.—Information from Land Stations outside the British Isles.

Foreign and Colonial Stations.—Periodical returns are received from certain stations in different British Colonies and dependencies, or in foreign countries.

A list of the stations, stating the character of the observations taken, is given on pp. 89 to 92. It includes two anemometer stations, Gibraltar and St. Helena.

The information contained in these returns is available upon the same conditions as that contained in the returns of British Stations.

E.—The Library.

Library.—In return for copies of publications the Office receives the weather reports and other publications of the official meteorological organisations of the world, and of many private organisations. A list arranged geographically of the institutions sending periodical publications containing meteorological data is given in Appendix VII.

The library has also gradually acquired a large collection of pamphlets and books bearing upon meteorological subjects.

The terms on which books and documents in the library can be consulted are stated on p. 43.

F.—Supply of Instruments and Forms to Observers.

Loan of Instruments.—In accordance with the terms of the Parliamentary grant the Office does not lend instruments for the use of observers except in the following cases :—

(1.) To the Captains of vessels who undertake to keep a Meteorological log during their voyage and forward it to the Office. (*See* p. 46.)

(2.) To the Telegraphic Reporting Stations in the British Isles.

(3.) To the First Order Stations in connexion with the Office.

(4.) To selected Stations in less frequented parts of the world where observations are deemed to be specially desirable.

(5.) To a limited number (230) of fishing communities.

Supply of instruments for observers at Land Stations.—The Director is authorised to supply, at a cost of 5 per cent. in addition to the contract prices and the cost of carriage, trustworthy instruments for standard meteorological observations to those who are willing to send copies of their observations to the Office. The risk of breakage in transit must be undertaken by the consignee. The Director will also, if desired, give advice about the site and exposure of the instruments.

Supply of forms.—Forms for recording the observations, and tables for reducing them, are supplied to observers for the Office free of charge. The postage of returns, addressed to the Director of the Meteorological Office, need not be prepaid.

Blank sunshine cards are supplied without charge to a number of stations, not exceeding 10 in each district (including official stations), on condition that the cards are returned to the Office for filing. In other cases, cards are supplied, at a special price, to observers contributing returns. Forms for other self-recording instruments are supplied to observers free of cost, provided that the records are deposited with the Office and that the forms required are of a type kept in stock by the Office for use at Official Stations.

For further information as to the supply of instruments, forms, &c., application should be made to the Office.

Fishery Barometers.

The Office possesses a number of Barometers which it lends for the use of fishing communities, where it is shown that the instrument will be of material service. As a condition of the loan the community is required to provide for the housing of the instrument and to keep and forward to the Office a record of daily readings. At a few of the stations the experiment has been made of lending a self-recording aneroidograph with an open scale instead of the ordinary mercurial barometer.

A copy of a manual specially compiled for the purpose accompanies the instrument, and is intended to point out in simple language the practical use of the Barometer, with a view to anticipating important changes in the weather in the neighbourhood of the fishing stations. The following is a list of stations that have been supplied with Fishery Barometers :—

List of Stations supplied with Fishery Barometers.

Shetland Isles.—*Uya Sound, Burravoe, *Nesting, Lerwick, *Sandwick, *Scalloway, Symbister, * Hamnavoe, *Walls.

Orkney Isles.—*Westray, Papa Westray, *Burray, *Kirkwall, Barswick.

Scotland, East coast.—*Duncansbay, *Freswick, *Auchengi *Keiss, *Ackergill, *Staxigoe, *Wick, *Lybster, *Dunbeat Hilton, *Inver, *Portmahomack, *Ballintore, *Cromarty, *Avoc *Nairn, *Burghead, *Portessie, *Port Knockie, *Portsoy, *Whit hills, *Gardenstown, *Rosehearty, Pitullie, *Fraserburgh, *Invera lochy, Pointlaw, Portlethen, *Skateraw, *Stonehaven, *Arbroat *Broughty Ferry, *St. Andrews, *Crail, *Cellardyke, *S Monance, *Burntisland, *Newhaven.

England, East coast.—*Berwick, *North Shields, *South Shield *Sunderland (Roker), *West Hartlepool, *Staithes, *Scarborou *Filey, *Flamborough, *Bridlington Quay, *Withernsea, *Hu *Lynn (2), *Wells, *Gorleston, *Lowestoft, *Walberswick, *Ha wich, *Brightlingsea, *West Mersea, *Maldon, *Leigh, *Margat *Deal, *Kingsdown, *Dover.

England, South coast.—*Bognor, *Ryde, *Bembridge, *Brixto *Atherfield, *Ventnor, *Yarmouth (Isle of Wight), Gorey (Jerse *Poole, *Weymouth, *Portland.

England, South-West coast.—*Budleigh Salterton, *Exmou *Cawsand, *Mevagissey, *Gorranhaven, *Devoran, *Portscat

* The Director has been in correspondence with the Fishery Boards concerning these stations.

*Penryn, *Durgan, *Porthallow, *Falmouth, *Coverack, *Newlyn (2), *Mousehole, *Penberth Cove, *Porth Guarra, *St. Ives, *Hayle, *Port Isaac, *Bideford, Burnham, Highbridge, Weston-super-Mare.

Wales.—*Briton Ferry, *Swansea, *Angle, *Milford, *Aberystwyth, *Carnarvon.

England, North-West coast. — *Fleetwood, *Morecambe, *Maryport.

Isle of Man.—Douglas, Port St. Mary, Peel (2).

Scotland, South-West coast.—*Port Patrick, *Cairn Ryan, *Port William.

Ireland, East coast.—Belfast, Bangor, Groomsport, Donaghadee, Ardglass, Carlingford, Glenarm, Greenore, Dundalk, Malahide, Howth, Kingstown (2), Bray, Wicklow.

Ireland, South coast.—Dunmore East, Dungarvan, Kinsale, Union Hall, Castletownshend, Baltimore, Schull (2), Crookhaven, Castletown (Berehaven), Lawrence Cove, Ballydonegan, Ballycrovane.

Ireland, West coast.—Valencia, Dingle, Tralee, Kilronan, Galway, Spiddal, Cleggan, Elly Bay, Ballyglass, Ballycastle (Co. Mayo), Mullaghmore, Donegal, Tribane, Killybegs, Teelin, Malinmore, Port Noo, Rosbeg, Burton Port, Kincashla, Bunbeg, Inniscoo Island.

Ireland, North coast. — Dunfanaghy, Rathmullen, Buncrana, Malin Head, Moville, Greencastle, *Port Stewart, *Portrush, *Port Ballintrae, Ballintoy, *Ballycastle (Co. Antrim).

Scotland, West coast.—*Lamlash, *Tarbert (Loch Fyne), *Loch Ranza. *Campbeltown, *Carradale; *Portnahaven, *Port Wemyss, Gruinard, and *Bowmore (Islay); *Mallaig; *Portree and *Armadale (Isle of Skye); *Isle of Soay, *Kyle of Lochalsh, *Plockton, *Ardneaskan, Shieldaig, Badachro, Ullapool, *East Mey, *Gills, *Stroma (2).

Hebrides.—*Ness, *Carloway, *Marvaig, *Crossbost, Stornoway, Portnaguran, Valtos, Obb, Bernera, *Boreray, *Lemreway, Loch Boisdale.

G.—Publication of Observations contributed by Volunteer Observers or by the Representatives of Local Authorities.

I. **General Regulations.**—(*a.*) The observations must in all cases be taken by a competent observer, from approved instruments, satisfactorily exposed. Approval of the instruments and exposure is subject to periodical inspection by the Office.

Regularity in taking the observations and dispatching the reports is essential.

(*b.*) The sunshine cards upon which returns have been based must be sent to the Meteorological Office for examination at the close of each month. Cards supplied to observers at the special price referred to on p. 60 will be returned after examination.

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* The Director has been in correspondence with the Fishery Boards concerning these stations.

(*c.*) The Director reserves the right to discontinue at any ti temporarily or permanently, the incorporation of informat received from any station in the Official reports.

(*d.*) Observers contributing returns to one of the publications the Office receive an official copy of the publication. It is reques that these copies may be filed in a public library or simi institution, or be returned to the Office when the observer has further personal use for them.

II. Publication in the Daily Weather Report.—For publication the Daily Weather Report, the information must be in accorda with one of the forms here specified :—

(*a*) **Full Telegraphic Report at 7 a.m.**—A complete record of barome temperature, wind, &c., based upon observations made at 7 a.m., at 6 p.m. of the previous day, and telegraphed each morning in t to reach the Office not later than 9 a.m. This information must sent in code, a copy of which, with other necessary instructions, be supplied by the Office. A manuscript copy of the observations a form provided for the purpose must be sent at the end of e month.

(*b.*) **Short Telegraphic Report at 6 p.m.**—A report, telegraphed in evening, and containing observations of the barometer, wi temperature and weather at 6 p.m., the maximum temperature the amount of bright sunshine for the day, and the minim temperature and the amount of rainfall for the previous 24 ho These observations must be sent in code form in time to reach Office not later than 7 p.m., the statistical information be supplemented by brief notes respecting any exceptional phenom which may have occurred, such as thunderstorms, unusually he rain, &c.

When the sun is above the horizon after 6 p.m , *i.e* , from about March 2 to September 23rd, the amount of sunshine given must be t recorded up to *6 p.m. only*, but in such cases a post card must dispatched to the Office later in the evening, giving the amount *the whole day.*

In exceptional circumstances a telegraphic report of sunshine only n be accepted, provided that it is supplemented by information by p

The cost of telegraphy must be borne locally.

Information derived from the 6 p.m. telegraphic reports is inclu in the evening remarks and summaries prepared in the Office communication to Newspapers and Press Agencies. It must supplemented whenever possible by the postal report at 9 p described under (*c*).

(*c.*) **Postal Report at 9 p.m.**—A record similar to that indicated un (*b*), but reporting observations by postcard (Form 231). If the po arrangements are such that a letter posted after 9 p.m. can delivered at the Meteorological Office by 9 a.m. on the following the report should be made up for the 24 hours ended 9 p.m., and pos immediately after that hour.

(*d.*) **Postal Report at 6 p.m.**—In places where the postal arrangeme do not admit of the service indicated under (*c*), a report in sim form may be made up for the 24 hours ended 6 p.m. and posted soon as possible after that hour.

NOTE.—At auxiliary climatological stations, for which tremes of temperature and rainfall amounts for the 24 ho ending at 9 a.m. are required, as well as the data referred to the messages dispatched at 6 p.m., separate minimum therm meters and raingauges should be provided for the two sets observations. A single maximum thermometer will suffice the instrument be read, but not *set*, at 6 p.m. At nor climatological stations, when the extremes of temperature u

for climatological purposes should be for the 24 hours ending 9 p.m., a double set of thermometers is not required if both thermometers are *set* only once a day, viz., at 9 p.m.

III. Publication in the Weekly Weather Report.—Observations are accepted from a limited number of stations for publication in the Weekly Weather Report. The information should consist of observations taken once daily of the maximum and minimum temperature and of the rainfall, together with the duration of bright sunshine, and brief notes on the weather of each day.

Observations of the minimum temperature on the grass, and of underground temperature at the depths of 1 foot and 4 feet are also included. Each return should be posted as soon as possible after the Sunday morning reading, in order that it may reach London by Monday.

IV. Publication in the Monthly Weather Report, and in the Monthly Issue of Observations at Stations of the Second Order.—For this purpose a monthly return must be sent so as to reach the Office *not later than the 10th* of the following month. Three forms of return are at present in use. In Form 355 provision is made for the complete set of observations made at a normal Climatological Station at which observations are recorded three times a day. In Form 319, the headings of the columns are similar, but they are arranged in different order, and provision is made for the entry of only two observations each day. Form 312 is similar to Form 319, but less extended.

II.—Regulations for the Supply of Information from Instruments belonging to the Meteorological Office by the Custodians of the Instruments.

The custodians of instruments maintained by the Meteorological Office are not allowed to supply information derived from the instruments in their charge without previous permission obtained from the Director.

Permission is not given when the information required can be obtained directly from the Office in the course of post. Applicants for information should in that case be referred to the Office.

In special circumstances the Director will give permission for information to be extracted by the custodian for the use of Local Authorities, provided—

(1) That a note shall be appended to the information thus supplied to the effect that "The information is derived from instruments belonging to the Meteorological Office, and is subject to correction or modification";

(2) That if the information be published, the note shall also be published;

(3) That a copy be kept of the information supplied, to be forwarded to the Meteorological Office if required.

If arrangement is made for the payment of the custodian for this service the Director must be informed.

In cases in which the extraction of provisional information is permitted, instructions for observing or tabulating will be given to the custodian, which must be strictly followed.

I.—OBSERVATORIES AND STATIONS IN CONNEXION WITH THE METEOROLOGICAL OFFICE.

Central Observatory.

Kew Observatory, Old Deer Park, Richmond, Surrey.

Superintendent: C. Chree, LL.D., Sc.D., F.R.S., *Assistant Director of Observatories.*

Telegraphic Address: "Weacher, Richmond, Surrey."

Magnetic Observatory.

Eskdalemuir Observatory, Langholm.

Superintendent: G. W. Walker, M.A.

Western Observatory.

Valencia Observatory, Cahirciveen, Ireland.

Superintendent: J. E. Cullum.

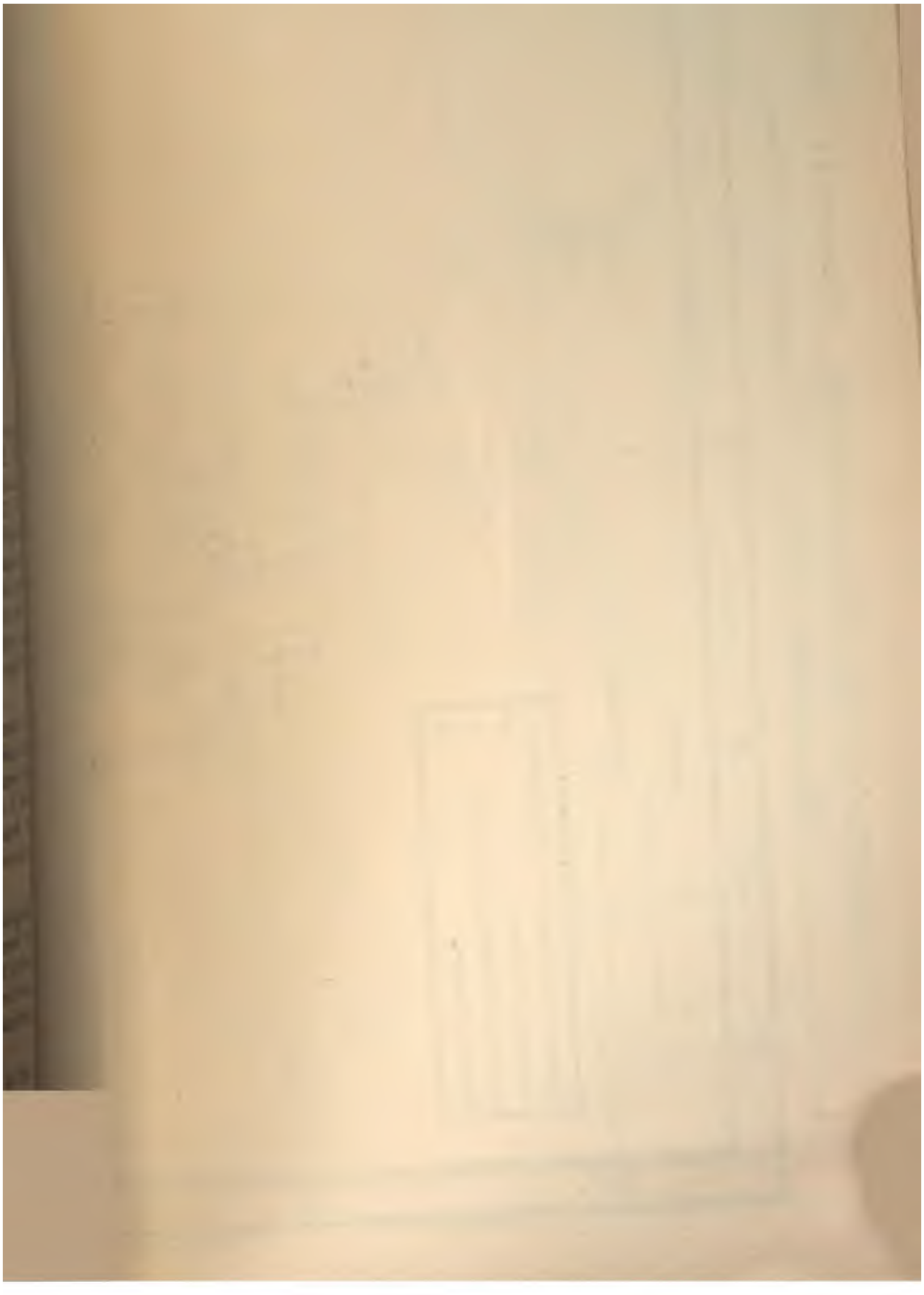
Kew Observatory was built in 1769 as a private observatory and an astronomical and physical laboratory for King George III. The building was placed at the disposal of the British Association in 1842 and taken over by the Royal Society of London in 1871. The Observatory formed a department of the National Physical Laboratory from 1900 to 1910, and passed under the management of the Meteorological Office from July 1, 1910. Besides the work of a normal meteorological observatory station of the first order of the international classification, the observatory undertakes experimental and research work in Meteorology, including Atmospheric Electricity, Terrestrial Magnetism, and Seismology.

Eskdalemuir Observatory was established by Government to continue the work of recording the magnetic elements which had been carried on at Kew Observatory and had been disturbed by electric tramways. It was opened in 1908. The work of the observatory includes routine work and experimental research in Terrestrial Magnetism, Atmospheric Electricity and Meteorology, as well as the maintenance of several Seismographs.

Valencia Observatory was established by the Meteorological Office in 1867 on Valencia Island. In 1891 it was transferred to Westwood House, Cahirciveen. Besides the work of a First Order Station and a Telegraphic Reporting Station, regular observations of magnetic force are made by arrangement with a committee organised by the late Earl of Rosse.

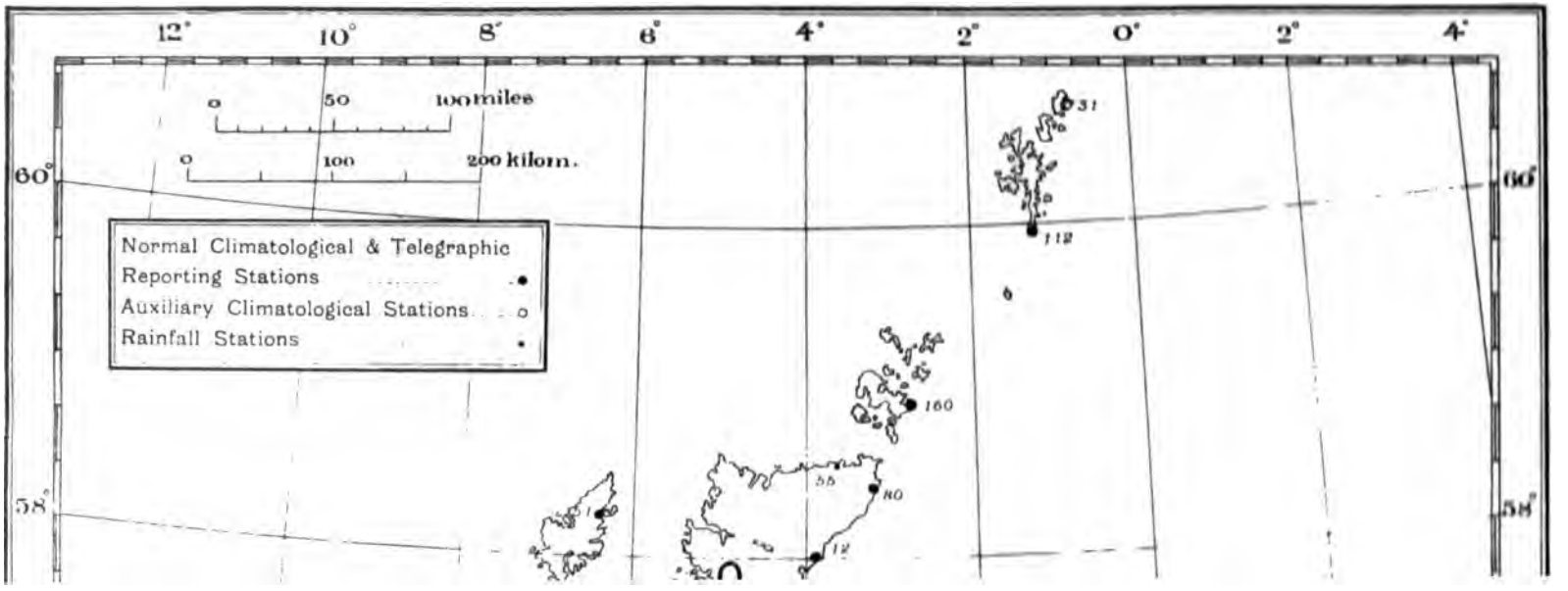
Other stations in connexion with the Office are shown in the list which follows on p. 68.

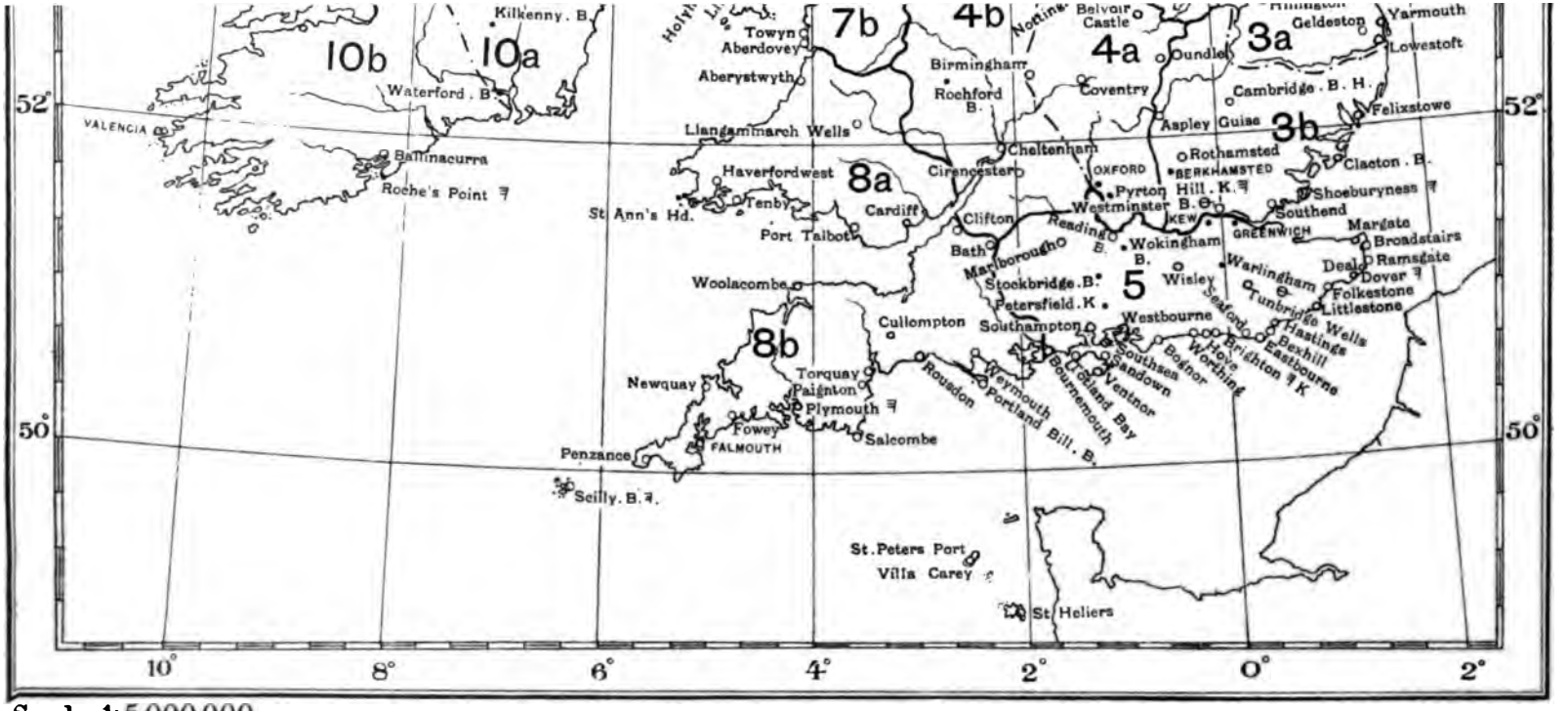
The returns from stations marked "S" are supplied by the Scottish Meteorological Society, those marked "R" by the Royal



REPORT OF THE METEOROLOGICAL COMMITTEE 1909-1910.

Map showing Positions of Climatological Stations.





Scale 1:5,000,000.

Ordnance Survey, Southampton 1910.

Stations in the London District are not all shown.

Meteorological Society. Stations marked respectively "M" or "S" are in connexion with the Societies as well as with the Office.

The list shows the order of classification of the stations and also the publication for which the returns are prepared in the Office. In specifying the order of the station a distinction has been drawn between eye observations and the records of autographic instruments. In general the returns received have formed the basis for the classification, but in cases in which more extensive observations are taken, but not forwarded to the Office, the corresponding symbol has been enclosed in brackets. The list makes no pretence to completeness in respect of these. The symbols used are explained as follows :—

I. Normal Meteorological Observatory : Station of the First Order.—Continuous records or hourly readings of pressure, temperature, wind, sunshine, and rain, with eye observations of the amount, form, and motion of the clouds, and notes on the weather. The autographic records are checked by frequent eye observations, and hence the symbol "I" has been entered in the table under both "Eye observations" and "Autographic."

II. Normal Climatological Station : Station of the Second Order.—Daily observations at 9 a.m. [3 p.m.] and 9 p.m. local time (or other accepted combinations of hours) of pressure, temperature (wet and dry-bulb), wind, amount of cloud, and weather, with the daily maximum and minimum of temperature, the daily rainfall, and remarks on the weather. Stations at which the additional observation at 3 p.m. is taken are distinguished by appending a suffix $_3$ to the symbol, thus—II_3.

III. Auxiliary Climatological Station : Station of the Third Order.—Observations similar in kind to those at the Normal Stations, but either (*a*) less full, (*b*) taken only once daily, (*c*) taken at hours other than 9 a.m. and 9 p.m.

T. Telegraphic Reporting Station.—Daily observations at 7 a.m., 1 p.m., and 6 p.m. G.M.T., similar in general character to those taken at Normal Climatological Stations, reported to the Office each day by telegraph. At some telegraphic stations an additional observation is taken at 9 p.m., and as the combination of hours 7 a.m., 1 p.m., 9 p.m. is accepted as suitable for stations of the Second Order of the international classification, these stations are distinguished by the two symbols T II_3.

●. (Eye Observations.) Additional Rainfall Station.—Daily observations, generally at 9 a.m., of the amount of rainfall.

✓. Additional Anemograph Station.—Continuous records of wind velocity (force) and, in most cases, also of wind direction.

B. Additional Barograph Station. — Continuous record of atmospheric pressure.

θ. Additional Thermograph Station.—Continuous record of atmospheric temperature.

●. (Autographic.) Additional Autographic Rain-gauge Station.—Continuous record of rainfall.

H. Hygrograph Station.—Continuous record of the relative humidity of the air.

⊙. Sunshine Station.—Continuous record of bright sunshine taken with a Campbell-Stokes recorder.

K. Kite or Balloon Station.—Records of Temperature, Humidity and Wind in the upper air.

The publications for which the returns are prepared are indicated by the following letters :—

D. Published *in extenso* in the "Daily Weather Report."

d. Published in abridged form in the "Daily Weather Report."

W. Weekly summary of temperature and rainfall and, if available, of sunshine, published in the "Weekly Weather Report."

w. Weekly summary of bright sunshine only, or of grass minimum, or earth temperatures, or of observations in the upper air, published in the "Weekly Weather Report."

M. Full monthly summary in the international form published in the "Monthly Weather Report."

m. Abridged monthly summary published in the "Monthly Weather Report."

(m.) Monthly totals of bright sunshine only or of rainfall only published in the "Monthly Weather Report."

S. Daily values published in "Observations at Stations of the Second Order" (1910).

R. Monthly summary published in the Reports of the Registrar-General of Births, Deaths, and Marriages for England and Wales, or for Ireland.

r. Weekly summary published in the Reports of the Registrar-General for England and Wales, or for Ireland.

✓. Daily summary of anemometer results published in "Observations at Stations of the Second Order and Anemograph Stations."

Height above Mean Sea Level.—The figures given in this column refer in general to the height of the ground on which the rain-gauge stands. At those stations which do not possess a rain-gauge, the figures refer to the height of the particular instrument in use.

The positions of the climatological and rainfall stations may be identified on the map, plate VIII., p. 64, from the figures which give their heights above Mean Sea Level, as shown in the following list.

*** From a number of stations in the British Isles printed summaries of observations are received. These have been included in the Geographical list of Institutions, &c., which issue publications (Appendix VII. to the Annual Report of the Meteorological Committee).

The following make monthly returns in a form similar to that in which observations are received from the normal or auxiliary climatological stations :—

Bolton.—The Museums and Meteorological Observatory.
Croydon.—Natural History Society.
Northampton.—Natural History Society.
Truro.—Cornwall County Council Sanitary Committee.

List of Stations arranged according to Districts and Counties.

The Counties are grouped in Districts which are numbered as follows :—

0. Scotland, N. { (*a*) Islands. (*b*) Mainland.
1. Scotland, E.
2. England, N.E. { (*a*) Northern Part. (*b*) Southern Part.
3. England, E. { (*a*) Northern Part. (*b*) Southern Part.
4. Midland Counties { (*a*) Eastern Part. (*b*) Western Part.
5. England, S.E. London County.
6. (*a*) Scotland, W., and (*b*) Isle of Man.
7. (*a*) England, N.W., and (*b*) North Wales.
8. (*a*) South Wales and (*b*) England, S.W.
9. Ireland, N. { (*a*) Western Part. (*b*) Eastern Part.
10. Ireland, S. { (*a*) Eastern Part. (*b*) Western Part.
11. English Channel (Western Section).

County and Station	Lat.	Long.	Height in feet above M.S.L.	Order of Station. Eye Obs.	Order of Station. Autographic.	Publication.	Year of last Inspection.	Observer.
0. SCOTLAND, NORTH.*								
(a.) *Islands.*								
Hebrides :— Castlebay, Barra Isle ...	56 57	7 29 W.	38	T II$_2$	B ⊙	D.W.M.	09	J. Smith, for M.O.
Stornoway	58 11	6 22 W.	51	T II$_2$	B ⊙	D.W.M.	09	W. Grant, for M.O.
Shetlands :—S. Baltasound	60 44	0 48 W.	31	III	⊙	W.m.	09	J. Edmonston Saxby, F.R.C.S., Ed.
Lerwick	60 9	1 8 W.	—	—	B	—	09	G. Gray, Harbour Master.
Sumburgh Head ...	59 51	1 17 W.	112	T II$_2$	B	D.W.M.	09	Rev. W. Brand, for M.O.
Orkney :— Deerness	58 56	2 45 W.	160	II	◢ ⊙	w.M.S.	09	M. Spence.
(b.) *Mainland.*								
Caithness :— Sandside, Reay ...	58 34	3 48 W.	55	●	—	—	—	Nicol McNicol.
Wick	58 27	3 6 W.	80	T	B	D.W.M.	09	Miss Sinclair, for M.O.
Cromarty :— Strathpeffer Spa ...	57 37	4 28 W.	200	II	⊙	W.M.d.	08	N. McLean, for H. W. Kaye, B.A., M.B.
Inverness :— *Fort Augustus ...	57 8	4 40 W.	68	II	⊙	W.M.	07	Rev. C. von Diepkhoff, O.S.B. and Rev. Ambrose Geoghegan, O.S.B.
*Fort William	56 49	5 7 W.	198	II	—	W.M.	07	W. T. Kilgour.

	... ...	...	...	...	...	...	...	...	...
	§Glencarron	57 30	5 14 W.	489	II	⊃	W.M.	07	D. D. Munro.
	Kinlochewe	57 36	5 24 W.	—	●	—	—	—	A. McLennan, for Hon. W. Peel, M.P.
Sutherland :—	§Dunrobin Castle ..	57 59	3 56 W.	12	II	—	M.S.	09	D. Melville, for the Duke of Sutherland, K.G.
	1. SCOTLAND, EAST.								
Aberdeen :—	Aberdeen Observatory	57 10	2 6 W.	46	I, T	I, B	D.W.M.	09	Professor C. Niven, F.R.S., and G. A. Clarke, for M.O.
	§Balmoral	57 2	3 12 W.	920	III	—	W.M.	08	J. Michie, M.V.O., and John M. Troup.
	Dyce	57 13	2 10 W.	149	●	—	—	—	James E. Crombie, LL.D.
	§Tillypronie	57 10	2 56 W.	1,116	II	—	M.S.	09	Robert Littlejohn, for the late Sir John F. Clark, Bart.
Banff :—	§Gordon Castle	57 37	3 5 W.	101	II	⊙	W.M.	08	C. Webster, for the Duke of Richmond and Gordon, K.G.
Berwick :—	§Marchmont	55 44	2 25 W.	498	II	⊙	W.M.	07	J. A. Wood, for Sir J. H. Hume Campbell, Bart.
Clackmannan :—	No station.								
Edinburgh :—	Edinburgh, Royal Observatory.	55 57	3 12 W.	441	—	◢	—	—	The Astronomer Royal.
	Edinburgh, Royal Botanic Garden.	55 57	3 12 W.	253	—	⊙	w.(m.)	—	The Regius Keeper.
	Leith	55 58	3 10 W.	18	T	B	D.W.M.	09	D. Drummond, Post Office, for M.O.
Elgin :—	No station.								
Fife :—	No station.								
Forfar :—	S. Balruddery	56 29	3 8 W.	276	III	⊙	w.m.	07	G. Davie, for J. Martin White.
	§Dundee	56 28	2 56 W.	160	II	—	M.S.	09	J Carnochan.
Haddington :—	No station.								
Kincardine :—	S. Crathes	57 3	2 25 W.	140	III	⊙ ⊖ B	w.m.	08	J. Smith.
	Stonehaven	56 58	2 13 W.	?86	III	⊙	d.m.	08	J. Hart, for Town Clerk.

* *Note.*—The parts of this district forming section (*a*) Islands, include the Shetlands, the Orkneys, and the Hebrides. The latter form part of the counties Inverness and Ross.

The names of Stations added to the list since April, 1909, are printed in clarendon type. The positions of the Stations can be identified on the map, Plate VIII., p. 64, from the figures which give their heights above Mean Sea Level.

List of Stations arranged according to Districts and Counties—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station. Eye Obs.	Order of Station. Autographic.	Publication.	Year of last Inspection.	Observer
1. SCOTLAND, EAST—*cont.*								
Kinross :— No station.								
Linlithgow :— No station.								
Nairn :— Nairn	° ′ 57 36	° ′ 3 52 W.	82	T	⊙	D.W.M.	09	Miss Penny, for M.O. and Dr. Solanders.
Peebles :— S. West Linton	55 45	3 4 W.	800	III	⊙	W.m.	08	Rev. J. S. Begg.
Perth :— Crieff	56 22	3 50 W.	440	II	—	W.M.	07	George Reid, for Dr. Meikle.
Forgandenny	56 21	3 29 W.	175	—	B ●	—	—	Miss M. Wood.
Roxburgh :— No station.								
Selkirk :— No station.								
2. ENGLAND, NORTH EAST.								
(a) *Northern Part.*								
Durham :— Durham	54 46	1 35 W.	336	II	⊙	W.M.R.	09	Prof. R. A. Sampson, M.A., F.R.S.
Seaham Harbour ...	54 50	1 19 W.	139	II	—	M.	07	G. H. Aird.
Northumberland :— Alnwick Castle ...	55 25	1 43 W.	210	III	◣	W.m.	09	Robert Kyle, for the Duke of Northumberland, K.G.
Cockle Park, Morpeth	55 13	1 41 W.	324	II	⊙	w.M.S.R.	09	T. E. W. Dobson, for the Northumberland County Council.
Font Watershed, Dam Site.	55 14	1 54 W.	620	●	—	—	—	H. G. Coventry, C.E., for the Corporation of Tynemouth.
Heddon-on-the-Wall ...	55 0	1 47 W.	400	●	—	—	—	Rev. W. G. Pringle.
Newcastle-on-Tyne ...	54 59	1 36 W.	152	III	◣	W.m.	07	N. H. Martin, F.R.S.E., F.C.S.
North Shields ...	55 0	1 27 W.	96	T	B	D.W.M.R.r.	09	R. Moat, Post Office, for M.O.

	Lighthouse.								
	Tynemouth	55 1	1 26 W.	90	II_3	⊙	d.	09	J. Edward Burnett.
Yorkshire, N. Riding:—									
	Ampleforth	54 12	1 6 W.	349	II	—	m.	09	Rev. D. Barton, O.S.B.
	Hovingham Hall ...	54 10	0 59 W.	120	●	—	—	—	Bingley Day, for Sir W. H. A. Worsley, Bart.
	Rounton	54 24	1 18 W.	249	II	—	W.M.	08	J. Hanagan, for Sir Hugh Bell, Bart.
M.	Scarborough	54 18	0 24 W.	100	II	⊙	d.W.M.	08	W. W. Larkin, for the Corporation.
	Whitby	54 29	0 37 W.	88	II	⊙M	M.	07	Thos. Newbitt, for the Literary and Philosophical Society.
	York, Deighton Grove	53 54	1 3 W.	38	●	—	—	05	Miss M. L. Whitehead.
	,, The Museum ...	53 57	1 5 W.	56	II	—	W.M.R.r.	07	Oxley Grabham, M.A., for the Yorkshire Philosophical Society.
	,, Bootham ...	53 57	1 5 W.	105	—	⊙	W.M.R.r.	07	Hugh Richardson, M.A.
Yorkshire, E. Riding:—									
	Bridlington (Grammar School).	54 5	0 13 W.	56	III	(B) ⊙	—	08	A. Thornton, M.A.
	Hull	53 45	0 16 W.	2	II	⊙	M.R.r.w.	08	H. B. Witty, for the Corporation.
	Spurn Head	53 34	0 7 E.	26	T	B	D.W.M.R.	09	J. E. Ayers, for M.O.
	(b) *Southern Part.*								
Lincolnshire:—	Claypole	53 2	0 46 W.	70	●	—	—	—	Rev. F. Hamilton.
	Fulbeck	53 3	0 37 W.	180	III	B ⊙	W.m.	07	Rev. Vere F. Willson, M.A.
	Lincoln...	53 14	0 33 W.	58	III	—	W.m.R.	09	W. Barr, for the Corporation.
	Mareham-le-Fen ...	53 8	0 5 W.	10	●	—	—	01	Mrs. G. L. Kime.
	Rauceby Hall	53 0	0 29 W.	124	III	⊙	w.m.	09	J. Hope, for General Sir M. Willson, K.C.B.
	Skegness	53 9	0 21 E.	12	III	⊙	d.w.M.	08	S. Coetmore Jones, for the District Council.
	Tealby	53 24	0 16 W.	251	II	—	m.	09	Rev. S. Lewin, B.A.
	Temple Bruer... ...	53 4	0 30 W.	—	●	—	—	03	Miss Alice S. Morley.

The names of Stations added to the list since April, 1909, are printed in clarendon type. The positions of the Stations can be identified on the map, Plate VIII., p. 64, from the figures which give their heights above Mean Sea Level.

List of Stations arranged according to Districts and Counties—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station. Eye Obs.	Order of Station. Autographic.	Publication.	Year of last Inspection.	Observer.
3. ENGLAND, EAST.								
(a) *Northern Part.*								
Norfolk :— Cromer	52 56	1 17 E.	196.	II	⊙	W.M.R.	06	W. H. Archer, for Urban District Council.
Geldeston	52 28	1 31 E.	37	II	⊙ (B θ)	W.M.	09	E. T. Dowson.
Hillington	52 48	0 33 E.	88	II	⊙	W.M.S.R.	08	Rev. H. E. B. Ffolkes, M.A.
M. Norwich	52 37	1 17 E.	93	III	—	W.R.r.m.	08	A. W. Preston.
Thetford	52 25	0 45 E.	169	●	—	—	—	E.S.Greenwood, for Town Council.
Yarmouth	52 37	1 43 E.	17	T, H_2	B ⊙	D.W.M.	09	Coastguard, for M.O. and for Corporation.
„ Gorleston ...	52 35	1 43 E.	10†	—		—	09	
(b) *Southern Part.*								
Bedford :— Aspley Guise	52 1	0 38 W.	410	—	⊙	m.	—	Mrs. Dymond.
Woburn, Ridgmont ...	52 1	0 36 W.	291	II	—	M.	08	H. M. Freear, F.C.S., for the Royal Agricultural Society.
Cambridge :— Cambridge Bot. Garden	52 12	0 8 E.	41	II	⊙	W.M.S.R.	07	R. Irwin Lynch, M.A.
„ The Observatory.	52 13	0 6 E.	88	—	B	—	05	A. R. Hinks, M.A., for Sir Robert Ball, F.R.S.
„ Newnham Coll.	52 13	0 5 E.	—	III	H	—	09	Miss Stephen.
Essex :— Clacton-on-Sea... ...	51 47	1 9 E.	54	T, H_2	⊙ B	D.W.M.R.	08	A. W. Shadick, for Urban District Council.
Shoeburyness	51 32	0 47 E.	13*	III		W.m.	09	The Superintendent of Experiments.
Southend-on-Sea ...	51 32	0 43 E.	90	III	⊙	w.m.	06	E. J. Elford, for the Corporation.
„ Waterworks	51 32	0 43 E.	110	● (8)	—	—		
Pennington	51 54	0 5 W.	406	II		M.R.	09	Rev. J. Dunne Parker, LL.D.
Hertford :— Berkhamsted	51 46	0 34 W.	400	II	⊙ (I)	M.R.	09	E. Mawley.
Offley Vicarage ...	51 56	0 21 W.	528	●	—	—	—	Rev. E. P. Gatty.

	Rothamsted	*51 48*	*0 22 W.*	*424*	III	⊙	W.m.	09	A. D. Hall, M.A., for the Lawes **Agricultural Trust.**
Huntingdon:—	No station.								
Middlesex:—	Harefield	51 36	0 29 W.	337	●	—	—	—	G. Eland.
Suffolk:—	Brandon	52 27	0 37 E.	48?	●	—	—	—	Lt.-Col. B. Spragge, D.S.O.
	Felixstowe	51 58	1 22 E.	10	III	⊙	d.W.m.	07	F. B. Jennings, for the District Council.
	M. Lowestoft	52 29	1 45 E.	83	II	⊙	w.d.M.	08	C. W. Edwards, for the Corporation.
	4. MIDLAND COUNTIES.								
	(a) *Eastern Part.*								
Buckingham:—	Beaconsfield	51 36	0 38 W.	360	●	—	—	—	C. T. Maroon, M.A.
	Winslow	51 57	0 53 W.	379	III	—	m.	06	R. A. Easton.
Derby:—	Belper	53 1	1 29 W.	222	III	—	m.	—	W. W. Tunnicliffe, B.Sc., F.C.S.
	M. Buxton	53 17	1 55 W.	987	II_2	⊙ (B)	d.W.M.R.	08	W. Pilkington, and F. T. Kieldsen.
	Chatsworth	53 14	1 37 W.	—	III	B θ	—	02	The Duke of Devonshire, K.G.
	Howard Estate, Glossop	53 27	1 57 W.	1,100	K	—	w.	—	Prof. J. E. Petavel, F.R.S., for the University of Manchester.
Leicester:—	Belvoir Castle	52 54	0 47 W.	259	II	⊙	R.M.	09	W. H. Divers, for the Duke of Rutland, K.G.
	Syston	52 43	1 5 W.	178	●	—	—	96	S. K. Daniels.
Northampton:—	*Chipping Warden* ...	52 9	1 16 W.	—	●	—	—	—	Rev. S. F. Cartwright.
	Great Billing	52 16	0 50 W.	273	●	—	—	—	Rev. G. H. Mullins, M.A.
	Oundle (The School)...	52 29	0 28 W.	144	III	⊙	—	04	F. H. E. Martin, for F. W. Sanderson, M.A., Headmaster.
	"	52 29	0 28 W.	146	●	—	—	04	N. E. Dixon, C.E.
	M. Raunds	52 22	0 33 W.	205	III	—	W.m.	08	Leon G. H. Lee.
Nottingham:—	Bawtry, Hesley Hall ...	53 27	1 4 W.	65	III	—	W.m.	09	B. I. Whitaker, J.P.
	Kingston-on-Soar ...	52 51	1 14 W.	125	III	—	m.	08	Fred Wakerly.
	Nottingham	52 56	1 9 W.	82	T, II_2	⊙ (◢ B ●)	D.W.M.R.r.	09	Arthur Brown, M.Inst.C.E., and Philip Boobbyer, M.D., for the Corporation.
	M. Worksop (Hodsock) ...	53 22	1 5 W.	56	III	⊙ (B ●)	w.m.	08	Col. H. Mellish, J.P.

The names of Stations added to the list since April, 1909, are printed in clarendon type. The positions of the Stations can be identified on the map, Plate VIII., p. 64, from the figures which give their heights above Mean Sea Level.

* Head of Anemometer 103 ft. above M.S.L. † Head of Anemometer 52 ft. above M.S.L.

List of Stations arranged according to Districts and Counties—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Autographic.			
4. MIDLAND COUNTIES—*cont.*								
(a) *Eastern Part*—cont.								
Oxford :— Oxford	51° 46′	1° 16′ W.	208	[I] T	⊙ [I]	D.W.M.R.	09	Dr. A. A. Rambaut, M.A., F.R.S.; W. Wickham, for M.O.
Pyrton Hill	51 38	1 1 W.	500	—	K ◢ B	w.	—	W. H. Dines, F.R.S., for M.O.
Rutland :— Ridlington	52 37	0 45 W.	522	●	—	—	—	N. W. Wortley.
Uppingham	52 38	0 43 W.	469	III	—	—	—	E. Hunter.
Warwick :— Coventry	52 25	1 30 W.	270	III	⊙	R.m.	07	E. Hugh Snell, M.D., for the Corporation.
Rugby School	52 22	1 15 W.	379	III	(B)	m.	08	Rev. D. E. Shorto, M.A.
Birmingham, Edgbaston	52 28	1 56 W.	535	II	⊙	d.W.M.R.r.	07	Alfred Cresswell, for the Midland Institute.
Yorkshire, W. Riding :— *Ackworth*	53 39	1 20 W.	131	III	—	—	06	W. H. Waite.
Bradford	53 49	1 46 W.	439	III	⊙	m.r.	09	H. Lander for the Corporation.
Garforth	53 48	1 22 W.	195	II	⊙	M.	09	Prof. Seton, B.Sc., for the University of Leeds.
Giggleswick	54 4	2 17 W.	500?	III	(B) ⊙	—	05	C. F. Mott, M.A.
M. Harrogate	54 0	1 33 W.	476	III	⊙	d.W.m.	08	C. E. Rivers, for the Corporation.
Huddersfield	53 39	1 47 W.	409	II_2	⊙ (●)	M.R.r.	09	J. Firth, Registrar, for the Corporation.
Leeds	53 48	1 33 W.	132	III	(B)	—	08	H. Crowther, for the Leeds Philosophical Society.
Sheffield	53 23	1 29 W.	429	II	⊙	w.M.R.	08	E. Howarth, F.R.A.S.
M Wakefield	53 41	1 30 W.	96	II	—	M.R.	08	Alex. French, M.R.C.S., L.R.C.P.
(b) *Western Part.*								
Gloucester :— Bristol, Over Court Park	51 32	2 35 W.	147	III	—	r.	07	R. C. Cann Lippincott.
Clifton, Bristol ...	51 27	2 37 W.	229	III	⊙	W.R.m.	08	D. Rintoul, M.A.
M Cheltenham	51 54	2 3 W.	214	II	▲	m.r.r.	00	A. C. Saxby, for the Corporation.

	Forest of Dean :—								
	Blakeney Hill ...	51 46	2 30 W.	500?	●	—	—	—	John Tyler
	Braceland	51 49	2 38 W.	500	●	—	—	—	E. P. Popert
	Edgehills Lodge ...	51 51	2 29 W.	700	●	—	—	—	Campbell Anderson for V. F. Leese.
	Ruardean Hill ...	51 50	2 32 W.	900	●	—	m.	05	John Morris for V. F. Leese.
	Whitemead Park ...	51 46	2 34 W.	200	●	—	m.	05	William Morris
	Worcester Lodge ...	51 48	2 35 W.	550	●	—	—	—	William Morris
	Hidcote	52 5	1 46 W.	524	●	—	—	97	Major W. Wright, R.A.
Hereford:—	M. Hereford (Belmont) ...	52 5	2 45 W.	291	III	—	W.m.	07	Canon T. B. Harrington, O.S.B.
Shropshire :—	Shrewsbury	52 43	2 45 W.	191	II	—	W.M.R.S.	09	Capt. C. S. Reid, R.E.
	Stokesay	52 26	2 52 W.	370	II	—	M.R.	09	Rev. W. M. D. La Touche, B.A.
Stafford :—	M. Cheadle (Tean) ...	52 58	1 57 W.	646	III	—	W.m.	08	Col. B. H. Philips.
	Mayfield	53 0	1 46 W.	374	III	(B ◪) ⊙	m.	09	G. C. Lawson.
Worcester :—	Birmingham, Sparkhill	52 27	1 52 W.	424	III	—	—	—	D. H. Owen.
	Rochford	52 18	2 36 W.	315	●	B	—	01	Rev. John Tomson.
	5. ENGLAND, SOUTH-EAST.								
Berkshire :—	Bucklebury Place ..	51 26	1 24 W.	409	III	—	m.	08	J. W. Harris, for A. W. Sutton.
	Maidenhead	51 30	0 43 W.	101	III	—	m.	06	G. H. Palmer.
	Reading (Leighton Park School).	51 26	0 57 W.	264	II	B ⊙	M.	07	J. Ridges, M.A., Headmaster.
	Wokingham	51 23	0 48 W.	216	III	B	m.	06	Medical Superintendent of Sanatorium.
Hampshire :—	Basingstoke	51 16	1 6 W.	289	III	—	m.	—	A. M. Pitkin, F.R.G.S.
	Bournemouth	50 43	1 53 W.	145	III	⊙	d.w.m.	08	C. Dales, for Town Council.
	Petersfield (Ditcham Park.)	51 0	0 57 W.	550	—	K	w.	—	C. J. P. Cave, M.A.
	M. Portsmouth	50 48	1 6 W.	11	III	—	R.r.w.m.	07	A. Mearns Fraser, M.D., for the Corporation.
	M. Sandown	50 48	1 8 W.	20	III	⊙ (B)	m.	—	G. E. Gilchrist, for the Sandown Advancement Board.
	Southampton	50 55	1 24 W.	65	II	⊙	W.M.S.R.	09	A. Vaughan, for Director-General of Ordnance Survey.

The names of Stations added to the list since April, 1909, are printed in clarendon type. The positions of the Stations can be identified on the map, Plate VIII., p. 64, from the figures which give their heights above Mean Sea Level.

List of Stations arranged according to Districts and Counties—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection	Observer.
				Eye Obs.	Autographic.			
5. ENGLAND, SOUTH-EAST—*cont.*								
Hampshire—*cont.* Southsea	50° 47′	1° 6′ W.	—	—	⊙	d.	09	A. Mearns Fraser, M.D., for the Corporation of Portsmouth.
Stockbridge(Ashley)	51 5	1 27 W.	235	●	B	—	—	Legh S. Powell.
Swarraton ...	51 8	1 11 W.	310	III	—	W.m.	09	Rev. W. L. W. Eyre, M.A.
Totland Bay ...	50 41	1 33 W.	140	III	⊙	m.	04	J. Dover, M.A.
M. Ventnor	50 36	1 13 W.	80	III	⊙	W.m.R.	06	Miss M. Gibson, for Royal National Hospital for Consumption.
Kent:— Broadstairs ...	51 21	1 26 E.	140	●	⊙	(m.)	—	Howard Hurd, C.E., and Rev. H. C. V. Snowden, for District Council.
Canterbury ...	51 17	1 5 E.	39	III	—	w.	05	A. Lander.
Deal	51 13	1 24 E.	23	III	⊙	d.	—	S. Miller.
Dover	51 7	1 18 E.	198	●	—	—	96	
Dover	51 7	1 19 E.	231	T	⊙	D.M.	09	W. C. Hawke, C.E., for the Corporation of Dover.
Kearsney, Chilton Farm.	51 8	1 17 E.	125	●	—	—	—	
Dungeness ...	50 55	0 58 E.	21	T	B	D.W.M.	09	W. S. Wilder, Lightkeeper, for M.O.
Folkestone ...	51 5	1 11 E.	121	III	⊙ (●)	d.m.	08	J. W. Stainer, for the Corporation.
Hildenborough ...	51 13	0 15 E.	160	●	—	—	—	Charles H. Scott.
Littlestone-on-Sea	50 59	0 59 E.	—	—	⊙	d.w.(m.)	05	H. T. Tubbs.
M. Margate	51 24	1 24 E.	35	III	⊙	d.W.m.	08	J. Stokes, J.P., for the Corporation.
Matfield... ...	51 9	0 22 E.	319	III	—	m.	—	D'Arcy Reeve.
Ramsgate... ...	51 20	1 25 E.	—	—	⊙	d.w.(m.)	08	T. G. Taylor, C.E., for the Corporation.
Sandgate	51 4	1 9 E.	50	●	—	—	99	R. A. Skelton and Chas. J. Conquest.

Surrey :—										
	Byfleet	*51*	*20*	*0*	*29 W.*	*65*	●	—	—	—	**R. W. Pretor-Pinney.**
	Epsom	*51*	*20*	*0*	*17 W.*	*160*	III	—	m.	—	**S. C. Russell.**
	Newdigate ...	51	0	0	17 W.	259	●	(B)	—	—	**R. J. Wallace.**
	Send	51	18	0	32 W.	99	●	(B)	—	—	**J. W. G. Bond.**
	Warlingham ...	51	18	0	3 W.	609	●	⊖	—	—	**R. H. Curtis.**
	Wisley	51	17	0	26 W.	150	III	⊙	W.m.	09	The Superintendent, for the Royal Horticultural Society.
Sussex :—	Bexhill-on-Sea ...	50	50	0	33 E.	27	II	⊙	d.m.	08	G. Brisley, M.P.S., for the Corporation.
	M. Bognor	50	47	0	40 W.	20	III	⊙	d.w.m.	06	H. Gardner, for the Bognor Climatological Society.
	M. Brighton	50	49	0	8 W.	31	III	⊙	d.w.m.R.r.	09	H. Heasman, for the Medical Officer of Health.
	Brighton	50	49	0	8 W.	380	—	K	w.	—	S. H. R. Salmon.
	Cuckfield	51	1	0	9 W.	389	●	—	—	97	E. Gosden.
	Eastbourne ...	50	46	0	17 E.	39	II	⊙	d.w.M.R.	08	S. R. Henderson, for the Medical Officer of Health.
	Hastings Cemetery	50	52	0	34 E.	499	●	—	—	—	Walter Field.
	,, Waterworks	50	51	0	34 E.	270	—	⊙	d.w.(m.)	06	J. Farnham, for the Corporation.
	Heathfield ...	50	58	0	16 E.	499	●	—	—	—	J. F. Leigh Clare.
	Hove	50	47	0	10 W.	—	—	⊙	m.	—	A. Griffith, M.O.H., for the Corporation.
	Lewes	50	52	0	1 E.	57	III	—	m.	08	Hon. C. Brand.
	St. Leonards ...	50	51	0	33 E.	178	II	—	W.M.	08	H. Colborne, M.R.C.S., for the Corporation.
	,, West Marina	50	51	0	32 E.	20?	III	—	—	06	T. Eldridge, for the Corporation.
	Seaford	50	46	0	6 E.	30	III	⊙	d.	—	Col. F. W. Savage.
	Watergate Park ...	50	56	0	55 W.	239	●	—	—	99	W. M. Christy.
	Westbourne ...	50	52	0	55 W.	30	—	⊙	(m.)	07	Rev. L. B. Birkett.
	M. Worthing ...	50	49	0	22 W.	36	III	⊙	d.w.m.	08	R. H. W. Wilshaw, M.B., D.P.H., for the Corporation.
Wilts :—	M. Marlborough ...	51	25	1	44 W.	424	III	⊙	W.m.	08	G. G. Becker, M.A., and Meddows Taylor.
	Salisbury (Wilton)	51	4	1	51 W.	180	II	—	M. R.	07	Thos. Challis, for the Earl of Pembroke, G.C.V.O.
	Salisbury ...	51	5	1	50 W.	165	II	—	—	—	Capt. H. Tudor Williams.

The names of Stations added to the list since April, 1909, are printed in clarendon type. The positions of the Stations can be identified on the map, Plate VIII., p. 64, from the figures which give their heights above Mean Sea Level.

List of Stations arranged according to Districts and Counties—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Autographic.			
LONDON DISTRICT.								
Barnet	51 39	0 10 W.	211	III	—	—	06	F. J. Bancroft, B.Sc., M.I.A.C.E., M.I.M.E.
Camberwell—								
The Green	51 28	0 5 W.	17	—	●	—	03	W. Oxtoby, M.I.C.E., for the Camberwell Borough Council.
Forest Hill	51 26	0 4 W.	160	—	●	—	03	
Leyton Square ...	51 29	0 4 W.	14	—	●	—	03	
Peckham Rd. ...	51 28	0 5 W.	21	—	●	—	03	
Camden Square ...	51 33	0 8 W.	110	II	⊙ (B ●)	M.R.	—	H. Robert Mill, D.Sc., LL.D.
Chelsea...	51 29	0 10 W.	24	●	—	—	—	T. W. E. Higgens, C.E., for the Chelsea Borough Council.
City (Bunhill Row) ...	51 31	0 5 W.	80	—	⊙	w.(m.)	—	Messrs. De la Rue.
East Ham	51 32	0 3 E.	12	III	—	—	—	J. Banks, for the Corporation.
Greenwich	51 28	0 0	155	I	(I)	W.M.R.r.	—	The Astronomer Royal.
Hampstead	51 33	0 11 W.	450	II	⊙	M.	09	E. L. Hawke, for the Hampstead Scientific Society.
Isleworth	51 29	0 20 W.	24	III	—	—	—	A. Worsley.
Kensal Green	51 32	0 13 W.	100	●	—	—	—	C. W. Heinemann.
Kew	51 28	0 19 W.	18	I	I	W.M.R.	08	C. Chree, Sc.D., F.R.S., Superintendent of the Observatory, for the Meteorological Office.
Pall Mall	51 30	0 7 W.	—	—	B	—	—	Athenæum Club.
Norwood	51 26	0 6 W.	220	II	—	M.R.	09	W. Marriott.
Plumstead	51 29	0 6 E.	300	—	⊙	m.	01	J. G. Waller.
Tottenham	51 36	0 5 W.	51	II	⊙	W.M.R.	06	J. F. Butler-Hogan, M.D., LL.D., for Urban District Council.
Westminster	51 30	0 8 W.	27	T	● B ⊖	D.W.M.R.	—	The Staff of the Meteorological Office.
„ Training Coll.	51 30	0 8 W.	107	—	⊙			J. H. Cowham and Rev. H. B. Workman, D.Lit.

Argyleshire:—	Ardnadam ...	55 59	4 56 W.	64	III	(B)	—	—	Rev. J. Cairns Mitchell, B.D.
	Gruline, Isle of Mull.	56 30	6 0 W.	100	●	—	—	—	J. W. Melles.
	Laudale	56 41	5 41 W.	14	III	—	W.m.	07	J. A. Fletcher.
	Loch Awe:—								
	Cruachan Bothy	56 14	5 28 W.	283	●	—	—	—	John Boyd, Crown Forester.
	Ford	56 10	5 26 W.	148	●	—	—	—	
	Oban	56 25	5 30 W.	20	II	⊙	d.m.	09	Edwin Baily, M.D., for District Council.
	\$Poltalloch	56 8	5 30 W.	132	II	—	W.M.	07	D. S. Melville, for Col. Malcolm.
Ayr:—	\$Colmonell	55 8	4 53 W.	150	III	(B)	W.	09	A. Ogg, for J. W. McConnel.
	Kilmarnock ...	55 37	4 36 W.	90	III	⊙	W.m.	08	George Stewart, for the West of Scotland Agric. Coll.
Bute:—	\$Rothesay	55 50	5 4 W.	115	II	—	W.M.	07	D. Penney.
Dumbarton:—	No station.								
Dumfries:—	\$Dumfries	55 4	3 36 W.	160	II	⊙	W.M.	09	C. C. Easterbrook, M.D., for the Crichton R. Institution.
	Eskdalemuir ...	55 19	3 12 W.	799	I	I	M.S.	—	G. W. Walker, M.A., Superintendent of the Observatory.
	S. Ruthwell ...	55 0	3 26 W.	67	II	⊙	m.	—	W. H. Whellens, for A. Johnstone Douglas.
Kirkcudbright:—	\$Cally (Gatehouse)	54 52	4 12 W.	120	II	—	W.M.	07	W. Thomson, for Col. F. Murray Baillie.
Lanark:—	Glasgow	55 53	4 18 W.	180	I	I	W.M.S.	09	Prof. L. Becker, Ph.D., for M.O.
	Thorntonhall ...	55 46	4 15 W.	440	III	⊙ B	m.	08	John Wilson, for A. Henderson Bishop.
Renfrew:—	No station.								
Stirling:—	No station.								
Wigton:—	No station.								
6. (*b*) ISLE OF MAN.									
	Douglas	54 10	4 28 W.	277	II	⊙	W.M.S.	08	Frank Cottle, for the Corporation.
	„	54 10	4 29 W.	137	—	B	—	—	Mrs. A. W. Moore.

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LIST OF STATIONS ARRANGED ACCORDING TO DISTRICTS AND COUNTIES—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Autographic.			
7. (*a*) ENGLAND, NORTH WEST.								
Cheshire:— Bidston	53 24	3 4 W.	188	(I) T	(I) ⊙	D.W.M.R.r.	04	W. E. Plummer, M.A., F.R.A.S., for the Mersey Docks and Harbour Board.
Hawarden Bridge ...	53 12	3 1 W.	22	III	—	W.m.	08	F. B. Summers.
M. Hoylake	53 23	3 12 W.	30?	III	⊙	w.m.	02	Tom Robinson, for Urban District Council.
Liscard	53 25	3 5 W.	84	●	B	—	—	H. Norman Edge.
Cumberland:— Aspatria	54 46	3 21 W.	250	II	⊙ (🌂)	W.M.R.	09	J. Smith Hill, B.A., B.Sc., Agricultural College.
Carlisle	54 53	2 57 W.	111	II	—	—	04	H. S. Cartmell, for the Corporation.
Newton Rigg... ...	54 40	2 49 W.	559	II	⊙	W.M.	08	W. T. Lawrence, for the Cumberland County Council.
Uldale (Chapel House Reservoir).	54 43	3 9 W.	599	●	—	—	—	T. Strong, for Aspatria and Silloth Water Board.
Lancashire:— M. Blackpool	53 49	3 3 W.	66	II	⊙ (B 🌂 ●)	d.W.M.	08	E. W. Rees Jones, M.D., D.P.H., for the Corporation.
Burnley	53 48	2 15 W.	459	III	⊙ (B)	m.r.	08	Thos. Holt, M.D., for the Corporation.
Carnforth (Over Kellet).	54 8	2 44 W.	174	III	⊙	m.	08	W. Farrer.
Darwen	53 41	2 28 W.	722	III	⊙	d.M.	08	F. G. Haworth, M.B., for the Corporation.
Fleetwood	53 56	3 1 W.	—	—	🌂	—	09	The Urban District Council, for the Meteorological Office.
Graythwaite	54 19	3 0 W.	180	●	—	—	—	H. I. Grosspelius.
Lancaster	54 3	2 47 W.	311	III	⊙ (🌂) ●	m..	09	Neville Holden, F.R.A.S., for the Storey Institute
Rossall Beach ...	53 55	3 2 W.	0	III	B	d.	—	T. G. Benn.

	Manchester (Oldham Road).	53 29	2 18 W	190	II	⊙	M.R.w.	08	J. Niven, M.A., M.B., for the Corporation.
	„ (Whitworth Park).	53 28	2 14 W.	125	II	K ⊙ (B ◢)	d.M.	08	The University of Manchester.
	„ (Prestwich)	53 32	2 17 W.	320	II	⊙	W.M.r.	08	F. Gore, for Medical Superintendent of the Asylum.
	M. Southport	53 39	2 59 W.	37	II_2	(I) ⊙ ◢	d.w.M.R. ◢	07	J. Baxendell, for the Corporation.
	Stonyhurst	53 51	2 28 W.	375	I	I	W.M.S.R. ◢	09	Rev. W. Sidgreaves, S.J., for M.O.
Westmorland:—	Kirkby Lonsdale ...	54 13	2 36 W.	304	●	—	—	—	R. A. Clarke.
7. (*b*) NORTH WALES.									
Anglesey:—	Holyhead (Salt Island)	53 18	4 39 W.	57	—	◢	◢	09	F. M. Cotton, C.E., for M.O.
	„ (town) ...	53 18	4 39 W.	48	T, II_2	B	D.W.M.	09	T. Chope, for M.O.
	Llaneugrad ...	53 30	4 16 W.	414	II	⊙ ◢ (B)	M.	—	W. E. Sotheby.
Carnarvon:—	Colwyn Bay	53 16	3 44 W.	82	III	⊙	d.m.	08	Wm. Jones, A.M.I.C.E., for Urban District Council.
	M. Llandudno	53 20	3 50 W.	71	II	⊙	d.W.M.R.	07	William Little, for the Town Council.
	Penrhyn Quarry ...	53 10	4 6 W.	527	●	—	—	01	W. J. Griffith, for E. A. Young.
Denbigh:—	Bettws-y-Coed ...	53 7	3 53 W.	101	II	⊙	d.W.M.R.	08	Dr. H. W. Fox, for District Council.
	Llanbedr Hall (Ruthin)	53 8	3 17 W.	450	●	—	—	—	George A. Crace-Calvert, M.B.
Flint:—	Penbedw	53 12	3 11 W.	650	—	B	—	—	H. W. Buddicom.
	Rhyl	53 19	3 29 W.	30	III	⊙	d.w.m.	08	A. A. Goodall, for District Council.
	St. Asaph (St. Beuno's College).	53 15	3 23 W.	479	III	(B)	m.	—	Rev. J. Rowland, S.J.
Merioneth:—	Aberdovey	52 33	4 4 W.	22	III	⊙	w.m.	07	W. J. Eves.
	M. Towyn	52 35	4 5 W.	10	III	⊙	d.m.	07	E. Lewys Lloyd, M.D., for Urban District Council.
Montgomery:—	No station.								
8. (*a*) SOUTH WALES.									
Brecknock:—	Llangammarch Wells	52 7	3 32 W.	550	III	⊙	W.m.R.	09	W. Black Jones, M.D., B.Sc., D.P.H.
Cardigan:—	M. Aberystwyth... ...	52 25	4 4 W.	59	III	⊙	d.w.m.	07	A. Thomas, M.D., for the Urban Council.
	Lampeter	52 7	4 5 W.	498	●	—	—	—	John C. Harford.
Carmarthen:—	Llandovery	51 59	3 48 W.	248	●	—	—	—	Douglas T. M. Jones.

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List of Stations arranged according to Districts and Counties—*continued.*

County and Station.		Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
					Eye Obs.	Autographic.			
8. (*a*) SOUTH WALES—*cont.*									
Glamorgan :—	Cardiff	51° 28′	3° 10′ W.	50	III	⊙	W.m.r.	07	E. Walford, M.D., for the Corporation.
	Port Talbot	51 34	3 45 W.	179	●	⊙	(m.)	03	Miss Talbot; G. Lipscomb.
	Swansea	51 37	3 55 W.	24	III	⊙	m.	07	D. Bliss, for the Corporation.
Pembroke :—	Haverfordwest ...	51 48	4 58 W.	93	(II)	⊙ (B)	(m.)	01	J. W. Phillips.
	Pembroke (St. Ann's Head).	51 41	5 11 W.	149	T, II_2	⊙	D.W.M.R.	08	J. F. Spicer, A. S. Jackson, Lightkeepers, for M.O.
	Tenby	51 41	4 42 W.	79	—	⊙	w.(m.)	03	Miss M. B. Truscott, for the Corporation.
Radnor :—	Llandrindod Wells ...	52 14	3 23 W.	699	●	—	—	—	W. B. de Winton.
	Rhayader Watershed	52 18	3 29 W.	*	(15) ●	—	—	—	Corporation of Birmingham, Water Department.
8. (*b*) ENGLAND, SOUTH WEST.									
Cornwall :—	Falmouth	50 9	5 4 W.	167	I	I	W.M.R.	09	Royal Cornwall Polytechnic Society, for M.O.
	„ Pendennis Castle.	50 8	5 3 W.	—	—	◢	—	09	Coastguard, for M.O.
	Fowey	50 21	4 38 W.	—	III	⊙	m.	—	Dr. W. H. Boger.
	M. Newquay	50 25	5 4 W.	100	III	⊙	w.(m.)	04	C. C. Vigurs, B.A., M.D., for Urban District Council.
	M. Penzance	50 7	5 32 W.	54	III	⊙ (B)	m.	08	Chas. H. Benn, for District Council.
Devonshire:—	Arlington Court ...	51 8	3 58 W.	613	III	—	W.m.	06	Miss Chichester.
	Barnstaple	51 5	4 3 W.	24	III	—	—	06	Thos. Wainwright, for the North Devon Athenæum.
	M Cullompton	50 51	3 23 W.	202	III	⊙	W.m.	07	M. T. Foster.
	Paignton	50 26	3 34 W.	11	[illegible]	[illegible]	[illegible]	—	F. J. Rodgers, for Town Council.
	Plymouth	50 22	4 8 W.	11a					[illegible] A.M.I.C.E., for

	Houndon	50 48	3 0 W.	515	II	⊙(B)	M.	07	C. Grover, for The Hon. Lady Peek.
	M. Salcombe	50 14	3 46 W.	300	—	⊙	(m.)	04	V. W. Twining, M.D.
	M. Sheepstor	50 29	4 1 W.	749	III	—	m.	—	Rev. H. H. Breton, M.A.
	M. Teignmouth ...	50 33	3 29 W.	20	III	⊙	d.m.	—	G. Rossiter for M.O.H.
	M. Torquay	50 28	3 31 W.	12	III	⊙	d.w.(m.)	00	F. March, for the Corporation.
	Whitchurch	50 32	4 6 W.	593	II	—	M.	07	E. E. Glyde.
	Woolacombe	51 10	4 12 W.	59	II	⊙	S.M.R.	07	R. N. Kivell, for Miss Chichester.
Dorset :—	Parkstone	50 43	1 56 W.	197	●	—	—	00	C. Mabey.
	Portland Bill... ...	50 32	2 27 W.	19	T, II,	B	D.W.M.R.	09	G. Carpenter, Lightkeeper, for M.O.
	Shaftesbury	51 1	2 12 W.	722	III	—	W.m.	09	Rev. F. Ehlvers.
	M. Weymouth	50 36	2 27 W.	21	III	⊙	d.m.	08	I. J. Brown.
Monmouth :—	Abergavenny ...	51 49	3 2 W.	178	●	—	---	—	A. V. Whitehead.
	Abersychan	51 44	3 5 W.	698	●	—	—	—	W. P. James.
	Newchurch	51 41	2 48 W.	525	●	—	—	—	
	Newport	51 35	3 0 W.	32	III	—	—	04	C. Cullum, for the Corporation of Newport.
	Pant-yr-eos	51 38	3 4 W.	449	●	—	—	00	
	Ynis-y-fro	51 38	3 3 W.	151	●	—	—	00	
Somerset :—	M. Bath	51 23	2 21 W.	66	T	(B)⊙	D.W.M.R.	09	W. H. Symons, M.D., for the Corporation.
	9. IRELAND, NORTH.								
	(a) *Western Part.*								
Galway :—	Ardfry	53 19	9 0 W.	—	—	B	—	—	W. M. Tattersall, for the Department of Agriculture for Ireland.
	Recess	53 28	9 44 W.	90	●	—	—	—	M. Macarthy, for the M. G.W. Railway.
Leitrim :—	Carrigallen	53 58	7 38 W.	350?	●	—	—	—	Miss Morrow.
Mayo :—	Blacksod Point ...	54 6	10 4 W.	37	T, II,	B	D.W.M.R.r.	09	The Chief Officer, Coastguard, for M.O.
	Mallaranny	53 55	9 40 W.	119	●	—	—	08	The Manageress of the Hotel for the M. G.W. Railway.
Roscommon :—	No station.								
Sligo :—	Markree Castle ...	54 11	8 27 W.	122	II	⊙	W.M.S.R.	09	J. R. Armstrong, for Captain Cooper, M.P.

The names of Stations added to the list since April, 1909, are printed in clarendon type. The positions of the Stations can be identified on the map, Plate VIII., p. 64, from the figures which give their heights above Mean Sea Level.

* 15 Rainfall Stations.

List of Stations arranged according to Districts and Counties—*continued.*

County and Station.		Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
					Eye Obs.	Autographic.			
9. IRELAND, NORTH—*cont.*									
(b) *Eastern Part.*									
Antrim :—	Belfast	54° 35′	5° 56′ W.	61	III	—	M.R.	09	John Wylie, B.A., and G. Robinson, for Prof. Morton.
	Glenarm	54 58	5 56 W.	41	●	—	—	—	The Earl of Antrim.
Armagh :—	Armagh	54 21	6 39 W.	196	II	◢⊙●	W.M.S.R.	09	J. L. E. Dreyer, Ph.D., for M.O.
Cavan :—	No station.								
Donegal :—	Dunfanaghy	55 11	7 58 W.	54	III	—	m.	—	J. J. MacGrath, L.R.C.P.
	Killybegs	54 40	8 27 W.	221	●	—	—	—	John C. Ward.
	Malin Head	55 23	7 24 W.	230	T	B	D.W.M.R.r.	09	Chief Officer, Coastguard, for M.O.
	Rosbeg (Narin) ...	54 50	8 30 W.	—	—	B	—	05	J. McLoone, Postmaster.
Down :—	Donaghadee	54 38	5 32 W.	40	T, II_s	B	D.W.M.R.r.	09	T. Arnell, Coastguard, for M.O.
Fermanagh :—	No station.								
Londonderry :—	No station.								
Longford :—	No station.								
Louth :—	No station.								
Meath :—	No station.								
Monaghan :—	No station.								
Tyrone :—	No station.								
Westmeath :—	No station.								
10. IRELAND, SOUTH.									
(a) *Eastern Part.*									

	„ Botanic Gardens.	53 23	6 16 W.	67	II	—	m.	07	F. W. Moore, M.R.I.A.
	„ Trinity College	53 21	6 16 W.	12	II	⊙	M.(R.)W.	07	W. J. Good and W. H. Clark, for Prof. Thrift.
	Dundrum	53 16	6 14 W.	200	III	—	—	—	Dr. Arthur S. Goff.
	Killiney	53 16	6 7 W.	249	●	—	—	—	R. O'Brien Furlong, C.B. and Mrs. G. B. Symes.
	M. Kingstown	53 17	6 8 W.	42	III	⊙	m.	09	R. A. O'Donovan, M.D., for the Corporation.
	„ Harbour ...	53 17	6 8 W.	—	—	◢	◢	09	Captain A. F. Holmes, R.N., for H.M. Office of Works.
Kildare :—	Clongowes Wood College.	53 19	6 41 W.	245	III	(B Θ) ⊙	m.	09	Rev. J. J. Nerney, S.J.
Kilkenny :—	Kilkenny	52 39	7 14 W.	212	III	B	W.m.	09	E. Sutton, for the Marquis of Ormonde, K.P.
King's Co. :—	Birr Castle	53 6	7 55 W.	175	II, T	⊙	D.W.M.S.R.r.	09	Dr. Boeddicker, for the Earl of Rosse.
Queen's Co. :—	Mountmellick ...	53 7	7 20 W.	253	III	—	m.	09	W. A. Robinson.
Waterford :—	Waterford	52 16	7 7 W.	—	—	B	—	02	Harbour Authorities.
	„	52 16	7 7 W.	20 ?	III	—	W.m.R.	07	J. N. White.
Wexford :—	No station.								
Wicklow :—	Bray	53 12	6 6 W.	153	●	—	—	—	Miss A. L. Scott.
	M. Newcastle	53 5	6 6 W.	256	II	—	m.	02	L. T. Burra, M.D.
	(b) *Western Part.*								
Clare :—	Ennistymon	52 57	9 17 W.	130	●	—	—	—	Rev. C. W. McDowell, M.A.
	Hurdlestown ...	52 48	8 38 W.	157	●	—	—	—	Lt.-Col. W. O. Bentley, R.A.
	Mount Callan ...	52 53	9 16 W.	479	●	—	—	98	Lt.-Col. Tottenham.
	Newmarket-on-Fergus.	52 46	8 53 W.	85	●	—	—	98	Alfred Barker, for W. W. A. Fitzgerald.
Cork :—	Ballinacurra	51 52	8 10 W.	24	III	⊙	w.m.	07	John H. Bennett.
	Doneraile	52 13	8 34 W.	266	●	—	—	—	Capt. J. W. Evans, J.P.
	Roche's Point ...	51 47	8 15 W.	32	T	—	D.W.M.R.r.	09	M. Fitz Mahony, Post Office, for M.O.
	„ „ ...	51 47	8 15 W.	—	—	◢	◢	09	Captain G. Usborne, for Cork Harbour Commissioners.

The names of Stations added to the list since April, 1909, are printed in clarendon type. The positions of the Stations can be identified on the map, Plate II., p. 64, by the figures which give their heights above Mean Sea Level.

List of Stations arranged according to Districts and Counties—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Autographic.			
10. IRELAND, SOUTH—*cont.*								
(b) *Western Part*—cont.								
Kerry:— Caragh Lake	° ′ 52 3	° ′ 9 53 W.	—	●	—	—	—	Admiral E. F. Jeffreys, C.V.O.
Killarney	52 4	9 30 W.	174	III	—	W.m.R.	09	E. W. Griffin, M.D.
Valencia	51 56	10 15 W.	30	I, T	I, B	D.W.M.R.r.	08	J. E. Cullum, for M.O.
„ Glanleam ...	51 56	10 20 W.	—	●	—	—	01	A. O'Donoghue.
Limerick:— Foynes	52 37	9 7 W.	108	III	—	W.m.	09	J. J. Alcorn, for Lord Monteagle, K.P.
Limerick (Derravoher)	52 38	8 40 W.	40	●	—	—	09	Sir A. W. Shaw.
„ (Mungret Coll.).	52 38	8 41 W.	—	II	(B)	M.	—	Rev. W. O'Leary, S.J.
Tipperary:— Cahir (Bengurragh)	52 22	7 56 W.	199	III	—	W.m.	—	R. W. Smith, Jun.
11. ENGLISH CHANNEL (WESTERN SECTION).								
Guernsey:— M. St. Peter Port, Villa Carey.	49 27	2 32 W.	180	III	⊙	W.m.	08	F. E. Carey, M.D.
St. Peter Port, Brooklyn.	49 27	2 31 W.	297	II	⊙ (B θ)	w.M.R.	08	Adolphus Collenette.
Jersey:— St. Aubin's	49 12	2 11 W.	25	T, II_2	—	D.W.M.R.	08	J. Fisher, for M.O.
St. Helier's	49 11	2 6 W.	—	—	⊙	d.w.(m.)R.	06	Signal Officer, Fort Regent, for M.O.
Scilly:— St. Mary's	49 56	6 18 W.	131	T, II_2	B ⊙	D.W.M.R.	09	The Coastguard, for M.O.

F Foreign Stations from which Reports are ɔeived daily by Telegraph. (*See* page 47.)

ɔe of Station.	Authority.
s (Iceland) ... d	Meteorological Institute, Copenhagen. Captain Ryder, *Director.*
ı, Faeröe Islands ..	
a	Meteorological Office, Stockholm. Dr. Hamberg, *Director.*
i	
ı	
... ...	
... ...	
... ...	
und	Meteorological Institute, Christiania. Professor Mohn, *Director.*
ɔs	
... ...	
... ...	Meteorological Institute, Copenhagen. Captain Ryder, *Director.*
... ...	
... ...	
... ...	Deutsche Seewarte, Hamburg. Admiral Herz, *Director.*
... ...	
... ...	
ɔr	Meteorological Institute, Utrecht. Dr. van Everdingen, *Director.*
... ...	Meteorological Service, Brussels. M. J. Vincent, *Director.*
Nez	Bureau Central Météorologique, Paris. M. Alfred Angot, *Director.*
... ...	
... ...	
Mathieu)	
le de Groix) ...	
lic	
(Ile d'Aix) ...	
... ...	
ɔ	
... ...	
... ...	
... ...	
... ...	
... ...	
... ...	
ɔn	
re (Corsica)... ...	
... ...	Central Meteorological Institute, Madrid. The late M. A. Arcimis, *Director.*
... ...	Observatory, Lisbon. M. Pina Vidal, *Director.*
Funchal)	Meteorological Service of the Azores. Major Chaves, *Director.*
'onta Delgada) ...	
Iorta)	

stations marked (1) report also at 1h. p.m., and those marked (2) at 6h. p.m.
s at 4h. p.m. instead of 6h. p.m., and Ponta Delgada at 3h. p.m.
ts from these stations are not published in the Daily Weather Report.

List of additional Stations from which Reports a[re] received for the Daily Weather Report. (*See* p. 47

Station.	Hour of Observation.		Station.	Hour of Observation.	
Strathpeffer..	6 p.m.	By wire.	Bournemouth	6 p.m.	By wire and p[o]
Oban	6 p.m.	By wire	Southsea ..	6 p.m.	By wire.
Dublin ..	4 p.m.	By post.	Bognor ..	6 p.m.	By wire and p[o]
Rossall Beach	6 p.m.	By post.	Worthing ..	6 p.m.	By wire and p[o]
Blackpool ..	6 p.m.	By wire; and 9 p.m. by post.	Brighton ..	6 p.m.	By wire and p[o]
			Eastbourne ..	6 p.m.	By wire and p[o]
Southport ..	6 p.m.	By wire; and 9 p.m. by post	Bexhill-on-Sea	9 p.m.	By post.
			Hastings ..	6 p.m.	By wire an[d] p[o]
Rhyl	8 a.m.	By wire; and 6 p.m. by wire and post.	Folkestone	6 p m.	By wire and p[o]
			Ramsgate ..	6 p.m.	By wire and p[o]
Colwyn Bay	6 p.m.	By wire and post.	Margate ..	6 p.m.	By wire and p[o]
Llandudno ..	6 p.m	By wire; and 9 p.m. by post.	Felixstowe ..	6 p.m.	By wire and p[o]
			Lowestoft ..	6 p.m.	By wire and p[o]
Bettws-y-Coed	6 p.m.	By wire.	Skegness ..	6 p.m.	By wire and p[o]
Towyn ..	6 p.m.	By wire and post.	Scarborough ..	6 p.m.	By wire; and 9 [p] by post.
Aberystwyth	6 p.m.	By wire.			
Plymouth ..	9 p.m.	By post.	Harrogate ..	6 p.m.	By wire and p[o]
Paignton ..	6 p.m.	By wire and post.	Buxton ..	6 p.m.	By wire and p[o]
Torquay ..	6 p.m.	By wire and post.	Darwen ..	9 p.m.	By post.
Teignmouth..	9 p.m.	By post.	Manchester ..	9 p.m.	By post.
Weymouth ..	6 p.m.	By wire and post.	Birmingham ..	9 p.m.	By post.

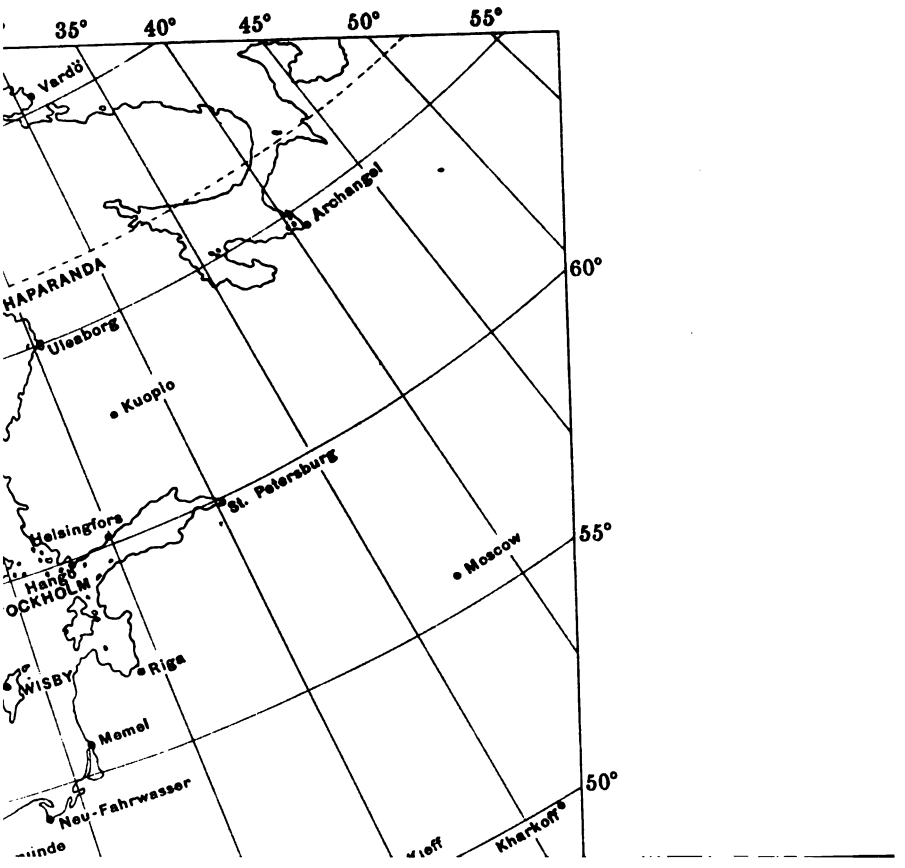
List of Sea Temperature Stations.

§*Aberdeen, Cove Bay.
*Arran, North, Galway.
†Bahama Bank Lightship.
§*Ballantrae, Ayrshire.
*Ballydonegan, Co. Cork.
†Barrels Rock Lightship.
*Blacksod Point, Co. Mayo.
†Blackwater Bank Lightship.
§*Burnmouth, Ayton, Berwick.
Burntisland.
†Carnarvon Bay Lightship.
§*Cleggan, Co. Galway.
†Coningbeg Lightship.
§*Cromarty.
†Daunts Rock Lightship.
§[1] Eastbourne.
†East Goodwin Lightship.
†English and Welsh Grounds Lightship.
†Fastnet Rock Lighthouse.
[2] Holyhead Harbour Office.
§*Kirkwall.
†Kish Bank Lightship.
§*Lamlash, Isle of Arran.
†Leman and Ower Lightship.
§*Lerwick.
*Liscannor, Co. Clare.
§[3] Margate.
†Morecambe Bay Lightship.
†Newarp Lightship.
§*Newquay, Cornwall.
†North Arklow Lightship.
*North Arran (*see* Arran).
†North-West Lightship.
†Outer Dowsing Lightship.
†Owers Lightship.
§*Pennan Bay (Aberdour).
§[4] Plymouth.
§[5] Port Erin.
*Portrush.
†Royal Sovereign Lightship.
*St. Ann's Head, Pembroke.
§*Salcombe, Devon.
§*Scarborough.
* Scilly Islands (St. Mary's).
§*Seafield, Co. Clare.
†Seven Stones Lightship.
†Shambles Lightship.
§†Sheephaven (Dunfanaghy).
§†Shipwash Lightship.
†Skulmartin Lightship.
†Solway Lightship.
†South Arklow Lightship.
†South Rock Lightship.
†Spurn Lightship.
*Stornoway.
*Sunderland.
§*Teelin, Co. Donegal.
*Usan (Montrose).
§*Wick.

The observers are indicated thus :—* Coastguard, † Lightkeepers, [1] S. F[.] Henderson, [2] F. M. Cotton, C.E., [3] W. J. Woodruff, [4] H. Victor Prigg, [5] Bi[o]logical Station.

§ Stations marked thus send weekly returns for publication in the Weekl[y] Weather Report.

To face p.


35°
40°
45°
50°
55°
Vardö
Archangel
60°
HAPARANDA
Uleaborg
Kuopio
St. Petersburg
Helsingfors
55°
Moscow
Rige
WISBY
Memel
Neu-Fahrwasser
50°
Kharkoff

List of Stations in the Colonies and Dependencies and in Foreign Countries from which Returns are received in Manuscript.

Note.—Returns received in printed form are not included in this list.

Station.	Latitude.	Longitude.	Height in Feet above M.S.L.	Order of Station.	Year of Commencement of Observations.	Observer.
Mediterranean.	° ′	° ′				
Cyprus,* ‡Famagusta	35 7 N.	33 57 E.	34	II	1881	The Chief Medical Officer.
,, ‡Kyrenia	35 21 N.	33 19 E.	54	II	1881	
,, ‡Larnaca	34 55 N.	33 37 E.	19	II	1881	
,, ‡Limassol	34 40 N.	33 1 E.	26	II	1881	
,, ‡Nicosia	35 11 N.	33 22 E.	493	II	1881	
,, ‡Papho	34 46 N.	32 25 E.	202	II	1881	
Gibraltar	30 6 N.	5 21 W.	48	II	1883	Colonial Secretary's Department.
Morocco, ‡Cape Spartel	35 47 N.	5 55 W.	191	II	1893	Edwin C. Hathaway, for Lloyds.
,, Mogador	31 30 N.	9 42 W.	19	●	1903	H. B. Johnstone, H.B.M. Vice-Consul.
,, Saffi	†32 17 N.	9 8 W.	40	●	1905	N. A. de Silva.
Syria, Beyrout	33 54 N.	35 28 E.	172	II	1883	A. S. Kheiri, B.A., for Alfred H. Joy, M.A., Director of the Syrian Protestant College.
Turkey, Smyrna	38 26 N.	17 9 E.	50	III	1908	H. Echiboukdjian, for Rev. Alex. MacLachlan, President, International College.
Africa.						
Central :—						
Uganda, Entebbe	0 4 N.	32 28 E.	3,863	III	1896	M. T. Dawe, Director of the Scientific Department.
,, Fort Portal	0 43 N.	30 8 E.	5,299	III	1901	
,, Gondokoro	4 51 N.	31 42 E.	1,500	III	1901	
,, Jinja	0 26 N.	33 11 E.	3,722	III	1901	

* By arrangement with the Colonial Office and the Survey Department of Egypt the returns for these stations are sent in the first instance to the Survey Department for use in connexion with its Monthly Weather Report. They are sent to the Office for ultimate filing.

† The positions and heights of the stations are those given by the observers, except in cases marked †, for which the information given has been obtained from other sources.

‡ The Meteorological instruments in use at this Station are lent by the Meteorological Committee.

List of Stations in the Colonies, &c., from which Returns are received in Manuscript—*continued.*

Station.	Latitude.	Longitude.	Height in Feet above M.S.L.	Order of Station.	Year of Commencement of Observations.	Observer.
Africa—*continued.*						
Central—*continued.*	° ′	° ′				
Uganda, Kampala	0 19 N.	32 35 E.	3,905	III	1907	M. T. Dawe, Director of the Scientific Department. Returns have been received also from 23 stations in Uganda which record rainfall only.
„ Koba	2 19 N.	31 29 E.	—	III	1907	
„ Masaka	0 21 N.	31 47 E.	—	III	1902	
„ Masindi	1 40 N.	31 50 E.	3,764	III	1906	
„ Mbarara	0 31 N.	30 47 E.	4,500	III	1901	
„ Nimule	3 39 N.	32 10 E.	2,034	III	1903	
West :—						
Gold Coast, Aburi	5 50 N.	0 10 W.	556	III	1893	Medical Department, Accra.
„ Accra	†5 35 N.	0 6 W.	—	III	1893	
„ §Addah	5 50 N.	0 38 E.	—	III	1895	
„ Axim	†4 50 N.	2 12 W.	—	III	1895	
„ ‡Cape Coast Castle ...	†5 15 N.	0 30 W.	—	III	1895	
„ Gambaga	†10 31 N.	0 26 W.	—	III	1899	
„ Kintampo	8 5 N.	1 30 W.	—	III	—	
„ Kumasi (Coomassie) ...	†6 50 N.	2 16 W.	859	III	1899	
„ Kwitta (Keta)	†5 59 N.	0 59 E.	—	III	1895	
„ Sekondi	5 0 N.	1 40 W.	20	III	1904	
„ Sunyani	7 22 N.	2 19 W.	—	III	1908	
„ Tamale	9 23 N.	0 50 W.	—	III	1908	
„ Tarkwa	5 11 N.	2 0 W.	245	III	1907	
Northern Nigeria :—						
Bauchi	10 17 N.	9 49 E.	2,300	III	1907	The Secretariat, Zungeru.
(Geidam) Dumjeri	12 53 N.	11 57 E.	?900	III	1907	
Ilorin	8 29 N.	4 32 E.	968	III	1907	
Kano	12 0 N.	8 33 E.	2,000	III	1907	
Katagum	12 17 N.	10 22 E.	108	III	1907	
Keffi	8 50 N.	7 52 E.	—	III	1907	
Kontagora	10 24 N.	5 24 E.	1,800	...		

Lokoja	7	48 N.	6	44 E.	270	III	1907	The Secretariat, Zungeru.
Maiduguri	11	48 N.	13	12 E.	1,200	III	1907	
Sokoto	13	1 N.	5	14 E.	1,160	III	1907	
Yola	9	12 N.	12	30 E.	850	III	1907	
Zaria	11	6 N.	7	43 E.	2,230	III	1907	
Zungeru	9	49 N.	6	10 E.	530	III	1907	
Sierra Leone	8	30 N.	13	9 W.	179	II	1895	The Principal Medical Officer.
Southern Rhodesia :—								
Ringstead Reef (Essexvale)	21	0 S.	29	0 E.	4,496	●	1908	Mrs. C. E. Fripp.
SOUTH AMERICA.								
British Guiana, Georgetown	6	49 N.	58	10 W.	0	⊙	1906	F. A. Stockdale, Government Botanist.
" " Mazaruni (Penal Settlement). ...		—		—	—	⊙	1908	
Venezuela, Guayanaviejá (El Perú) ...	7½	0 N.	62	0 W.	1,000 ?	II B ⊖	1910	Dr. E. H. Griffen, for the Goldfields of Venezuela, Ltd.
CHINA.								
Chinkiang	32	13 N.	119	27 E.	40	II ⊙	1905	Capt. Lewis H. Tamplin.
NORTH ATLANTIC OCEAN.								
Bermuda Dockyard	32	20 N.	64	51 N.	30	—	1889	Lieut. C. E. Stainer, R.N.
Bahamas, Nassau	†25	2 N.	77	25 W.	—	III	1895	R. W. D. Albury.
" ‡*Abaco	25	51 N.	77	11 W.	75	II	1859	G. C. Pinder
" ‡*Cay Lobos	22	22 N.	77	35 W.	—	II	1877	S. W. Roberts
" ‡*Cay Sal	23	42 N.	80	25 W.	40	II	1859	J. A. Thompson
" ‡*Inagua	20	56 N.	73	41 W.	40	II	1871	E. J. Jones
" ‡*Watling's Island	24	8 N.	74	26 W.	120	II	1889	J. S. Solomon
								Lightkeepers, for Board of Trade.
Barbados	†13	12 N.	59	35 W.	181	II	1895	John R. Bovell, Superintendent Botanical Department.
‡*Sombrero	18	36 N.	63	28 W.	34	II	1867	A. L. Richardson, Lightkeeper, for the Board of Trade.

* Lighthouse ; contributes register containing observations every 4 hours.
† The positions and heights of the stations are those given by the observers, except in cases marked †, for which the information given has been obtained from other sources.
‡ The Meteorological instruments in use at this Station are lent by the Meteorological Committee.
§ No observations received, Feb. 1902-June, 1909.

List of Stations in the Colonies, &c., from which Returns are received in Manuscript—*continued.*

Station.	Latitude.	Longitude.	Height in Feet above M.S.L.	Order of Station.	Year of Commencement of Observations.	Observer.
South Atlantic Ocean.	° ′	° ′				
Falkland Islands :—						
*†Cape Pembroke	51 41 S.	57 42 W.	70	II	1859	J. Pearce, Lightkeeper, for the Board of Trade.
‡Stanley...	—	—	—	⊙ B	—	His Excellency the Governor.
‡St. Helena : St. Matthew's Vicarage ...	16 0 S.	5 40 W.	1,887	II	1885	A. L. C. Hands.
,, Central, Oak Bank ...	—	—	1,696	●	1902	J. Homagee.
,, St. Paul's Vicarage ...	—	—	1,694	●	1905	Alfred Porter.
South Georgia. Grytviken	54 14 S.	36 33 W.	10	II	1906	R. MacDougall, for the Argentine Fishery Company, transmitted by the Governor of the Falkland Islands through the Board of Trade.
Pacific Ocean.						
British Solomon Islands :—						
Tulagi	9 5 S.	160 8 W.	163	III	1907	The Resident Commissioner.
Fiji :—						
Suva	18 8 S.	178 0 E.	44	II	1906	C. H. Knowles, Superintendent Department of Agriculture.
Fanning Island	3 54 S.	159 23 W.	—	III	1903	The Pacific Cable Board.
Malden Island	3 59 S.	155 0 W.	—	II	—	Geo. H. Crocker.
†Ocean Island	0 52 S.	169 36 E.	159	II R.	1905	W. H. Knight, for the Pacific Phosphate Company.
Indian Ocean.						
Madagascar :—						
Antananarivo	18 55 S.	45 16 E.	—	●	1903	T. P. Porter, H.H.M. Consul.
Mauritius, Royal Alfred Observatory ...	20 6 S.	57 31 E.	181	(I)	1901	T. F. Claxton, Director.

* Lighthouse : contributes register containing observations every 4 hours.
† The Meteorological instruments in use at this Station are lent by the Meteorological Committee.

K.—List of Publications Issued under the Authority of the Meteorological Committee of the Royal Society (1867 to 1874), the Meteorological Council (1877 to 1905), or the Meteorological Committee appointed by Treasury Minute, May 30th, 1905.*

These List is arranged under the following headings:—

1. Reports of the Meteorological Office and of International Meetings.
2. Observations and Data for Stations in the United Kingdom.
3. Observations and Data for Foreign and Colonial Stations.
4. Marine Meteorology. Atlases and Memoirs.
5. Reports of Investigations in Dynamical and Statistical Meteorology and other Memoirs.
6. Handbooks and Year Books.

Reports of the Meteorological Office and of International Meetings.

Reports of the *Meteorological Committee* of the Royal Society (8vo.):—
1867–1877. At prices varying from 4d. to 1s. per Report, except 1874–1877, 2s. 5d.

Reports of the *Meteorological Council* (8vo.):—
1879–1905. At prices varying from 3d. to 1s. 3d., except 1884–5, 4s. 4d.

Reports of the *Meteorological Committee* (8vo.):—
1905–06. Price 1s. 4d.
1906–07. „ 1s. 7d.
1907–08. „ 1s. 5d.
1908–09. „ 1s. 5d.
1909–10. „

International Codex of Resolutions adopted at Congresses, Conferences and at Meetings of the Permanent International Committee 1872–1907. (No. 200.) 1s. 3d. (8vo.)

Reports of Proceedings at International Meetings (8vo.):—
Leipzig. 1872. (Non-Official, No. 1.) 1s.
Vienna. 1873. (No. 31.) 1s.
Vienna and Utrecht. 1873 and 1874. (Non-Official, No. 9.) 1s. 6d.
London. 1874. Maritime Meteorology. (No. 23.) 2s.
London. 1876. With Supplement. (Non-Official, No. 11.) 2s.
Utrecht. 1878. (Non-Official, No. 13.) 6d.
Rome. 1879. (No. 35.) 1s. 6d.
Berne. 1880. (Non-Official, No. 14.) 1s.
Copenhagen. 1882. (Non-Official, No. 15.) 2s. 6d.
Paris. 1885. (Non-Official, No. 16.) 1s. 1896. (No. 127.) 1s. 1907. (No. 197.) 1s. 6d.
Zürich. 1893. (Non-Official, No. 17.) 4d.
Munich. 1891. (No. 172.) 1s. 6d.
Upsala. 1894. (No. 115.) 1s.
St. Petersburg. 1899. (No. 145.) 2s.
Southport. 1903. (No. 154.) 2s.
Innsbruck. 1905. (No. 166.) 2s.

Report on Weather Telegraphy and Storm Warnings. 1873. (Non-Official, No. 8.) 6d. (8vo.)

Reports . . . on Atmospheric Electricity, Maritime Meteorology, and Weather Telegraphy. 1874. (Non-Official, No. 12.) 2s. (8vo.)

* The publications are sold by Messrs. Wyman and Sons and other agents for the sale of publications of H.M. Stationery Office: Annual Reports by Parliamentary Booksellers: Pilot Charts and Charts published by the Admiralty, by J. D. Potter.

2. Observations and Data for Stations in the United Kingdom.

Daily Weather Report. Subscription 5*s.* per official quarter. (4to.)

BRITISH METEOROLOGICAL YEAR BOOK from 1908. (4to.)

Part I.—**Weekly Weather Report.* 6*d.* per week. With Appendices priced separately.

Part II.—*Monthly and Annual Supplements:* Monthly Weather Report, summaries of observations from about 200 stations in the British Isles, and charts. 6*d.* each part. Subscription for Parts I. and II., inclusive of postage, 30*s.* per annum.

Part III.—*Monthly issue of daily observations at Stations of the Second Order and Anemograph Stations.* In parts, January to December, 1908, 2*s.* each; from January, 1909, at 1*s.* 6*d.* each.

Part IV.—*Monthly issue of Hourly Readings at four Observatories in connexion with the Meteorological Office.* In separate parts for each Observatory. 6*d.* each.

Monthly Weather Reports (4to):—

1884–1887.† In Monthly Parts 1*s.* 6*d.* to 2*s.* 6*d.* each, except May to December, 1887, which is in wrapper, price 12*s.*

Quarterly Weather Report (4to):—

1869–1880. At prices varying from 4*s.* to 10*s.* each Quarterly Part. 1877–1880:—Appendices and Plates are published for these years at 27*s.* or 28*s.* per Yearly set.

‡*Hourly Readings* from the Self-Recording Instruments at the . . Observatories (4to):—

1881–1886. In Parts, varying in price from 10*s.* to 30*s.* each.

1900–1909. 25*s.* each, or 6*d.* per month each station. 1910 *see* British Meteorological Year Book. Part IV.

Hourly Means (*for Five-days and Calendar Months*) of the Readings obtained from the Self-Recording Instruments at the . . . Observatories under the Meteorological Council (4to):—

1887–1899. In Annual Volumes, at prices varying from 15*s.* to 38*s.*

Meteorological Observations at Stations of the Second Order (4to):—

§1876–1906. At prices varying from 20*s.* to 35*s.*

1907. In the Press. 1908–1909, 16*s.* each.

1910. (*See* British Meteorological Year Book. Part III.)

AVERAGES:—

Quinquennial table of averages of Temperature, Rainfall, and Sunshine at Stations in the British Isles. Latest issue, for the period ended 1905 (about 150 Stations). 1*s.* (4to.) Forms Appendix III. to Weekly Weather Report, 1906.

Rainfall:—

Diurnal Range of Rain at the Seven Observatories in connexion with the Meteorological Office, 1871–1890. (No. 143. 1900.) 2*s.* 6*d.* (8vo.)

Rainfall Tables of the British Isles for 1866–80. Compiled by G. J. Symons, F.R.S. (No. 47. 1883.) 7*s.* 6*d.* (8vo.)

Rainfall Tables of the British Islands, 1866–90. (No. 114. 1897.) 6*s.* (8vo.)

Sunshine:—

Sunshine Records of the United Kingdom for 1881. (No. 56. 1883.) 4*s.* (8vo.)

Ten Years' Sunshine in the British Isles, 1881-90. (No. 98. 1891.) 2*s.* (8vo.)

Temperature:—

Temperature Tables for the British Islands. (No. 154. 1902.) 10*s.* 6*d.* Supplement:—Difference Tables for each Five Years for the Extrapolation of Mean Values. 3*s.* (4to.)

ATLAS:—

Meteorological Atlas of the British Isles. (No. 53. 1883.) 5*s.* 6*d.* (4to.)

* The publication of the Weekly Weather Report began in February, 1878. Annual subscription, including Supplements and Appendices, post paid, 1878–1883, 12*s.* 6*d.*; 1884–1888, 21*s.* 2*d.*; 1889–1907, 30*s.*

† The publication of the Monthly Weather Report was continued after 1887 as a Supplement to the Weekly Weather Report.

‡ For the years 1874–1880 the Hourly Readings were issued in lithographed form. Price 20*s.* per annum. The Hourly Readings for Kew and Valencia are for the years 1895–1900.

§ The Observations at Stations of the Second Order for 1873–75 will be found in the Quarterly Weather Report for the respective years.

3. Observations and Data for Foreign and Colonial Stations.

Contribution to the Meteorology of Japan.—By Staff-Com. Thomas H. Tizard, H.M.S. "Challenger." (No. 28. 1876.) [Out of Print.]

Meteorological Observations at the Foreign and Colonial Stations of the Royal Engineers, and the Army Medical Department, 1852-1886. (No. 83. 1890.) 23*s*.

Meteorological Observations made at Sanchez, Samaná Bay, St. Domingo, 1886–1888.—By the late W. Reid, M.D. (No. 89. 1890.) 8*s*. 6*d*.

Report on the Meteorology of Kerguelen Island.—By Rev. S. J. Perry, S.J., F.R.S. (No. 37. 1879.) 3*s*.

Climatological Observations at Colonial and Foreign Stations :—

I. :—Tropical Africa, 1900–1902, with Summaries and Map.—By E. G. Ravenstein, F.R.G.S. (No. 165. 1904.) 6*s*. (4to.)

4. Marine Meteorology, Atlases and Memoirs.

CHARTS :—

Arabian Sea :—

Daily Weather Charts for the period of six weeks ending June 25, 1885, to illustrate the tracks of two cyclones in the Arabian Sea. (No. 80. 1891.) 10*s*. (4to.)

Atlantic :—

Charts of Meteorological Data for the Nine 10° Squares of the Atlantic, which lie between 20° N. and 10° S., and extend from 10° to 40° W., with accompanying Remarks, ending with the Best Routes across the Equator. (No. 27. 1876.) 24*s*. (17 × 20 ins.)

Monthly Current Charts for the Atlantic Ocean. From information collated and prepared in the Meteorological Office. Published by the Admiralty. (No. 132. 1897.) 10*s*. (22½ × 18 ins.)

Atlantic, North :—

Charts of Meteorological Data for Square 3, Lat. 0°–10° N., Long. 20°–30° W. (20 × 13½ ins.) and Remarks to accompany the Monthly Charts, which show the Best Routes across the Equator for each Month, &c. (17 × 16½ ins.) (No. 20. 1874.) 20*s*.

Charts illustrating the Weather of the North Atlantic Ocean in the Winter of 1898–99. (No. 142. 1901.) 6*s*. 6*d*. [Out of Print.]

Currents and Surface Temperature of the North Atlantic Ocean, from the Equator to Latitude 40° N., for each Month of the Year. With a General Current Chart. (No. 12. 1872.) 2*s*. 6*d*. (4to.)

Discussion of the Meteorology of that Part of the Atlantic lying North of 30° N., for the eleven days ending 8th February, 1870. With Charts. (No. 13. 1872.) 5*s*. (4to.)

Meteorology of the North Atlantic during August, 1873, with 31 Synoptic Charts. (No. 32. 1878.) With book of Charts, 15*s*. (15 × 22 ins.)

Synchronous Weather Charts of the North Atlantic and the adjacent Continents, 1st August, 1882, to 3rd September, 1883. Parts I. to IV. (33 sheets each). (No. 71. 1886.) 17*s*. each Part. (26 × 22 ins.)

Atlantic, South :—

Charts showing the Surface Temperature of the South Atlantic Ocean in each month of the Year. (No. 4. 1869.) 2*s*. 6*d*. (18½ × 12½ ins.)

Wind Charts for the Coastal Regions of South America, from information collated and prepared in the Meteorological Office. Published by the Admiralty. (No. 159. 1902.) 7*s*. (27 × 20½ ins.)

Monthly Wind Charts of the South Atlantic. Published by the Admiralty. (No. 168. 1903.) 6*d*. each. (20 × 27 ins.)

The relation between Pressure, Temperature, and Air Circulation over the South Atlantic Ocean. (No. 177. 1905.) 9*d*. (8vo.)

Atlantic, Indian, and Pacific Oceans :—

Charts showing the Surface Temperature of the Atlantic, Indian, and Pacific Oceans. (No. 59. Second Edition, 1903.) 4*s*. 6*d*. (19¼ × 14½ ins.)

Charts showing the Mean Barometric Pressure over the Atlantic, Indian, and Pacific Oceans. (No. 76. 1887.) 10*s*. 6*d*. Supplementary Chart. 6*d*. (27 × 20¾ ins.)

4. Marine Meteorology—*continued.*

CHARTS—*continued.*

Atlantic (North) and Mediterranean :—

Monthly Meteorological Charts, commencing April, 1901. (No. 149.) 6*d.* each. Subscription for one year, 5*s.* (exclusive of postage.) (22 × 30 ins.)

Indian Ocean :—

Monthly Current Charts for the Indian Ocean, from information collated and prepared in the Meteorological Office. Published by the Admiralty. (No. 124. 1896.) 7*s.* (20 × 24½ ins.)

Monthly Meteorological Charts of the Indian Ocean and Red Sea. Commencing May, 1906. (No. 181.) 6*d.* each. Subcription for one year, 5*s.* (exclusive of postage.) (1906–10 30 × 22 ins., 1910–11 30 × 30 ins.)

Indian Ocean (North) :—

Meteorological Charts of the portion of the Indian Ocean adjacent to Cape Guardafui and Ras-Hafún. (No. 92. 1891.) 6*s.* (17½ × 23¾ ins.)

Indian Ocean (South) :—

Cyclone Tracks in the South Indian Ocean, from information compiled by Dr. Meldrum, C.M.G., F.R.S. (No. 90. 1891.) [Out of print.]*

Meteorological Charts for the Ocean District adjacent to the Cape of Good Hope, with accompanying Remarks. (No. 43. 1882.) Charts, 25*s.*; Remarks, 7*s.* (19¼ × 24 ins.)

Pacific Ocean :—

Quarterly Current Charts for the Pacific Ocean, from information collated and prepared in the Meteorological Office. Published by the Admiralty. (No. 134. 1897.) 5*s.* (26½ × 28½ ins.)

Wind Charts for the Coastal Regions of South America, from information collated and prepared in the Meteorological Office. Published by the Admiralty. (No. 159. 1902.) 7*s.* (27 × 20½ ins.)

Red Sea :—

Meteorological Charts of the Red Sea. (No. 106. 1895.) 21*s.* (22 × 13½ ins.)

Southern Ocean :—

Meteorological Charts of the Southern Ocean between the Cape of Good Hope and New Zealand. (No. 123. 1899.) [New Edition, 1907.] 6*s.* (17¼ × 19½ ins.)

OTHER PUBLICATIONS ON MARINE METEOROLOGY :—

Contributions to our Knowledge of the Meteorology of the Arctic Regions. (Official, No. 34. 1885.) Vol. 1 : Part I., 2*s.*; II., 10*s.*; III., 6*s.*; IV., 5*s.*; V., 6*s.* (4to.)

Contributions to our Knowledge of the Meteorology of the Antarctic Regions. (No. 18. 1873.) 2*s.* (4to.)

Contributions to our Knowledge of the Meteorology of Cape Horn and the West Coast of South America. (No. 11. 1871.) 2*s* 6*d.* (4to.)

Notes on the Form of Cyclones in the Southern Indian Ocean.—By C. Meldrum, M.A , F.R.S. (Non-Official, No. 7. 1873.) [Out of print.]

On the Physical Geography of the part of the Atlantic which lies between 20° N. and 10° S. and extends from 10° to 40° W. A Paper read before the British Association at Bristol, in August, 1875.—By Capt. H. Toynbee, F.R.A.S. (Non-Official, No. 10. 1876.) [Out of print.]

On the Winds, &c.. of the North Atlantic along the Tracks of Steamers from the Channel to New York. Translated from a Paper issued by the Deutsche Seewarte, Hamburg. (Non-Official, No. 5. 1872.) 6*d.* (8vo.)

Report to the Committee of the Meteorological Office on the Meteorology of the North Atlantic.—By Capt. H. Toynbee, F.R.A.S. (Non-Official, No. 2. 1869.) 1*s.* (8vo.)

Report on the Gales experienced in the Ocean District adjacent to the Cape of Good Hope between Lat. 30° and 50° S., and Long. 10° and 40° E.—By Capt. H. Toynbee, F.R.A.S. (No. 44. 1882.) 7*s.* 6*d.* (4to.)

Routes for Steamers from Aden to the Straits of Sunda and back. Translated from a Paper issued by the R. Meteor. Inst. of the Netherlands. (Non-Official, No. 4. 1872.) [Out of print.]

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* Reproduced upon the Meteorological Charts for the Indian Ocean, No. 181.

:eports of Investigations in Dynamical and Statistical Meteorology and other Memoirs.

ındon Fog Inquiry, 1901–03 :—
Report of the Council, with Report by R. G. K. Lempfert, M.A. (1904). (No. 160. 1904.) 2*s.* 6*d.*
Report by Captain Alfred Carpenter, R.N., D.S.O (1903). 2*s.*
ɪamical Meteorology :—
Report on the Storm of October 13–14, 1881.—By Robert H. Scott, F.R S. (No. 46. 1882.) 1*s.* 6*d.* [Out of print.]
Report of an Inquiry into the Connexion between Strong Winds and Barometric Differences.—By Robert H. Scott. (Non-Official, No. 1. 1869.) 6*d.* (8vo.)
Report to the Committee of the Meteorological Office on the use of Isobaric Curves.—By Capt. H. Toynbee, F.R.A.S. (Non-Official, No. 3. 1869.) [Out of print.]
Barometric Gradient and Wind Force. Report to the Director of the Meteorological Office by E. Gold, M.A., Fellow of St. John's College, Cambridge, Superintendent of Instruments. (No. 190.) Price 2*s.* 6*d.* (4to.)
Life History of Surface Air Currents. A Study of the Surface Trajectories of Moving Air.—By W. N. Shaw, Sc.D., F.R.S. (Director of the Meteorological Office) and R. G. K. Lempfert, M.A. (No. 174. 1906.) 7*s.* 6*d.* (4to.)
The Free Atmosphere in the Region of the British Isles. Contributions to the Investigation of the Upper Air. (No. 202. 1909.) Price 2*s.* 6*d.* (4to.)
ıtistical Meteorology :—
The Beaufort Scale of Wind-force. Report of the Director of the Meteorological Office upon an Inquiry, with a Paper by G. C. Simpson, M.Sc., and Notes by Sir G. H. Darwin, K.C.B., F.R S., W. H. Dines, F.R.S., and Commander Campbell Hepworth, C.B., R.N.R., Marine Superintendent. (No. 180. 1906.) 1*s.* 6*d.* (4to.)
Harmonic Analysis of Hourly Observations of Air Temperature and of Pressure at British Observatories. (No. 93. 1891.) 12*s.* (4to.)
The Trade Winds of the Atlantic Ocean. Contributions to the Study of of the North-East and South-East Trade Winds. (No. 203.) (4to.) [In the Press.]

6. Handbooks and Textbooks. (8vo.)

ɔmeter Manual. (No. 8. 1871.) [Out of Print.]
ɔmeter Manual for the Use of Seamen. With an Appendix on the 'hermometer, Hygrometer, and Hydrometer. Sixth Edition, extensively ɛevised. 1909. (No. 61.) 3*d.* A Text Book of Marine Meteorology.
ıery Barometer Manual. New Edition, 1887. (No. 3.) 6*d.*
ɪructions for Meteorological Telegraphy. New Edition, 1906. (No. 2.) 'repared for the use of Observers exclusively.
ı Observer's Handbook. A new Edition of Dr. Scott's Instructions in the se of Meteorological Instruments. (No. 191.) 3*s.*
ts to Meteorological Observers in Tropical Africa, with Instructions for ıking Observations, and Notes on Methods of recording Lake Levels. ɜcond Edition, revised 1907. (No. 162.) 9*d.*
ɪASTING :—
ı to the Study and Forecast of Weather.—By W. Clement Ley, M.A. Vo. 40. 1880.) 1*s.*
ıciples of Forecasting by means of Weather Charts.—By the Hon. Ralph bercromby, F.R.Met.Soc. Second Edition, Revised, 1885. (No. 60.))ut of Print.]

APPENDIX III.

LIST of CAPTAINS who have sent in Logs classed as "Exc during the year ending March 31, 1910. Figures are a to the name of each observer to show the nun "Excellent" logs which he has supplied during the time of his co-operation with the Office.

Name of Captain.	Number of "Excellent" Logs.	Ship.
Barcham, S.	3	S.S. "Britannia."
Bayldon, F. J., Lieut. R.N.R. ...	9	S.S. "Moresby."
Bennett, C. D., Comm. R.N.R., R.D.	15	S.S. "Macedonia."
Carnon, J. R., Lieut. R.N.R. ...	6	S.S. "Caledonian."
Chudley, T. H., Lieut. R.N.R. ...	1	S.S. "Kia Ora."
Darley, C. E.	3	S.S. "Clan Buchanan
Docherty, H.	12	Ship "Eva Montgome
Griffiths, A. M.	3	S.S. "Hillmere."
Hanson, F. W. A., Lieut. R.N.R. ...	1	S.S. "Wilcannia."
Harris, G. H., Lieut. R.N.R. ...	12	S.S. "Worcestershire." / S.S. "Leicestershire."
Hemming, H. C.	4	S.S. "Den of Ogil."
Henderson, S., Lieut. R.N.R., R.D.	1	S.S. "Durham Castle.
Henning, G. C., Comm. R.N.R. ...	2	S.S. "Mooltan."
Higgins, C. J.	4	S.S. "Macinnes."
Hollis, H.	2	S.S. "Niwaru."
Hunt, A.	1	S.S. "Bohemia."
Kemp, A. H.	9	S.S. "Mimiro."
Kempson, C. H., Lieut. R.N.R. ...	6	S.S. "Athenic."
Kirkwood, R.	2	S.S. "Saxon Prince."
Lingham, W. G., F.R.A.S., F.R. Met. Soc.	5	S.S. "Wilcannia." / S.S. "Wakool."
Mais, E.	1	S.S. "York Castle."
Millican, J. W.	33	S.S. "Keyingham."
Moodie, J.	1	S.S. "Camphill."
Morrison, D.	1	S.S. "City of Corintl
Moseley, F. J., Comm. R.N.R. ...	4	S.S. "Durham Castle.
Mullan, F.C., F.R.G.S.	29	S.S. "Ramsay."
Notley, F. B.S., Comm. R.N.R., R.D.	2	S.S. "China."
Pattman, R.	7	Ship "Loch Torridon
Simpson, A., F.R. Met. Soc. ...	51	S.S. "Pericles."
Steeves, T. G.	1	S S. "Jason."
Weir, A. R.	1	S.S. "Clan Macintyre
Young, G.	4	S.S. "Clan Macfadyer

METEOROLOGICAL REGISTERS received during the Year 1909–10.

(1.)—*From the* ROYAL NAVY.—*Meteorological Logs* (9).

H.M. Ship.	Commanding Officer.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
				Mths. Days.	
"Cambrian"	E. W. E. Wemyss, Capt.	H. L. L. Pennell, Lieut., E. G. Morris, Lieut., J. C. S. Hilton, Lieut., R. P. Ross, Sub-Lieut.	1	1 16	Colombo to Australia.
"Egeria"	J. F. Parry, Capt. ...	A. F. S. Grant, Lieut.	1	6 20	Surveying, Vancouver Coasts.
"Merlin"	F. C. Learmonth, Capt.	V. I. Griffith, Sub-Lieut.	2	7 25	Surveying, China Sea.
"Mutine" ... {	C. E. Monro, Capt. / E. C. Hardy, Commr. }	C. I. Greer, Lieut., T. Lundholm, Sub-Lieut.	3	11 19	Surveying, West Coast of Africa.
"Sealark"	B. O. M. Davy, Commr.	J. W. Seddon, Lieut.	1	8 10	Surveying, Ceylon Coast.
"Waterwitch" ...	H. P. Douglas, Lieut. and Commr.	C. H. Knowles, Lieut.	1	3 22	Surveying, China Sea.

(2.)—SPECIAL SERVICE.—*Uncommissioned Ships* (2).

"Conway," H.M.S. ...	H. W. Broadbent, R.D., Commr. R.N.R.	Cadets	1	2 16	River Mersey.
"Worcester," H.M.S.	D. Wilson Barker, Commr. R.N.R., F.R.S.E., F.R.A.S., &c.	Cadets	1	4 0	Off Greenhithe.

METEOROLOGICAL REGISTERS received during the Year 1909–10—*continued.*

(3.)—*From the* MERCANTILE MARINE.—*Meteorological Logs* (270).

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.		Voyage.
				Mths.	Days.	
"African Prince," S.S.	C. B. Andersson ...	E. Purdy, R. D. Williams	2	5	11	Calcutta, *viâ* Cape, Suez, Monte Video, New Orleans.
"Alfalfa," S.S. ...	A. Osmond	... ...	1	58	3	River Plate, Bahia Blanca.
"Amazon," S.S.	H. E. Rudge ... H. D. Doughty ...	C. L. Willats, L. J. Buret, R. H. Dadsworth, R. O. Lloyd W. M. Mathews, A. S. Mackay, Sub-Lieut. R.N.R.	1	3	17	Pernambuco.
"Amberton," S.S. ...	A. Heron	J. T. Colvin, S. T. Stratton, W. J. Miller ...	1	2	5	Bahia Blanca.
"Aorangi," S.S. ...	J. D. S. Phillips ...	E. A. Wrigley, E. C. Mason, E. P. Cooper, C. S. Hudson.	3	10	18	Trans-Pacific, Victoria, B.C., and Brisbane.
"Apollo," S.S. ...	T. A. Tait	A. Jones, A. W. Drew, G. Sinclair	1	4	0	Bahia Blanca.
"Assyria," S.S. ...	R. J. Garrick	R. O. Lewis	3	6	9	Calcutta, *viâ* Suez.
"Athenic," S.S. ...	C. H. Kempson, Lieut. R.N.R.	G. A. Alcock, Lieut. R.N.R., V. W. Hickson, Lieut. R.N.R., F. J. Burd, W. S. Thornton, E. K. Irving, Sub-Lieut. R.N.R.	3	8	23	New Zealand, *viâ* Capes.
"Atrato," S.S. ...	F. M. Watson	R. Harvey, W. Tarrant, C. Delahay, S. L. Smith.	1	3	21	West Indies, Colon, New York.
"Asuncion de Larrinaga," S.S.	J. V. de A. Echevarria...	J. D. de Arana	1	6	6	East Coasts of North and South America.
"Avon," S.S.	L. R. Dickinson ...	A. Dadd, F. Cook, W. H. Townsend, Sub-Lieut. R.N.R., K. D. Shoesmith.	1	5	4	River Plate.
"Balaena," S.S. ...	J. W. Murray	... ...	1	4	0	Greenland Seas, Whaling.
"Barranca," S.S ...	W. Long	B. G. Drake, Lieut. R.N.R., E. G. Martin, W. G. Preece, H. C. Hake, A. N. Newitt, A. D. Riselev.	3	9	19	Port Limon.

"Bohemia," S.S.	A. Hunt G. Mitchell ...	G. Mackenzie, A. Fraser	3	8 6	Calcutta, *viâ* Suez.
"Bostonian, S.S. ...	J. Parry	J. Trickey, J. Arkle, J. Wilson, — Westlake, — Porter.	1	3 4	Boston, U.S.A.
"Breconshire," S.S. ...	J. M. Tomlinson ...	G. Kershaw, T. Hughes, R. M. Legge, Sub-Lieut. R.N.R.	1	3 27	Calcutta, Hong Kong, *viâ* Suez.
"Britannia," S.S. ...	S. Barcham	W. R. Calder, Sub-Lieut. R.N.R., C. E. Short, A. Parnis.	1	3 3	Bombay, China, *viâ* Suez.
"Caledonian" S.S. ...	J. R. Carnon, Lieut. R.N.R.	R. D. Allinson, L. Mann	2	6 29	U.S.A.
"Camphill," S.S. ...	J. Moodie	J. Horne, J. Johnstone	1	3 29	Baltimore, San Francisco, *viâ* Magellan, Melbourne.
"Carpentaria," S.S. ...	J. S. Hutchison, Commr. R.N.R.	W. G. Fitt, J. W. Schlincher, J. H. Longhurst.	2	7 6	Australia, *viâ* Suez and Cape.
"Cheshire," S.S.	H. P. Langston... W. Sturgess ...	F. W. Midgley, C. E. Stone, W. McGhie, P. de Legh, C. Hill, R. Sharp, B. W. Adamson, E. Fall.	3	6 2	Rangoon, *viâ* Suez.
"China," S.S....	E. Street ... F. B. S. Notley, R.D., Commr. R.N.R.	B. B. Hetherington, Lieut. R.N.R., H. A. Monro, A. J. Morton, E. F. Hannan, J. L. Hughes, N. A. Wicks.	3	8 10	Australia, *viâ* Suez.
"Chirripo," S.S. ...	E. H. Jones	E. J. West, G. E. Ryan, O. Pitts, R. Langston, C. Hake.	2	5 25	Port Limon.
"City of Corinth," S.S.	A. J. Elliot ... D. Morrison ...	J. McArthur	3	6 4	Calcutta, *viâ* Suez.
"Clan Buchanan," S.S.	C. E. Darley ... A. W. Simpson ...	F. R. Elwell, H. Matthews, E. C. Joel, — Swanston, — Elliot, — Leck.	2	5 20	Bombay, Madras, *viâ* Cape and Suez.
"Clan Forbes," S.S. ...	R. G. Becket	W. I. Mason, Lieut. R.N.R., A. W. P. Gibb, T. B. Storey, Sub-Lieut. R.N.R., J. H. Bain, E. C. Whiteford, W. C. Campbell, J. Hocking.	3	7 10	East Indies, *viâ* Cape and Suez.
"Clan Lindsay," S.S.	W. Harris	A. H. Young, F. J. Hawley, S. Knight ...	1	2 8	Bombay, Chittagong, *viâ* Suez.
"Clan Macfadyen," S.S.	G. Young	A. Clark, S. B. Watson, A. H. Hutton, E. B. Turtle, G. C. Macey, J. Gibbons.	3	8 7	Cochin, Mangalore, *viâ* Cape and Suez.
"Clan Macfarlane," S.S.	W. H. Price	R. Davidson, R. W. Mackie, G. G. Lardner, F. Beard, D. MacKinnon, P. Hart, A. D. Callaghan, O. Smith.	2	10 22	Mauritius, Vancouver, B.C., China, Japan, Australia, *viâ* Capes and Suez.

METEOROLOGICAL REGISTERS received during the Year 1909-10—*continued.*

(3.)—*From the* MERCANTILE MARINE.—*Meteorological Logs*—continued.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations. Mths.	Days.	Voyage.
"Clan Macinnes," S.S.	C. J. Higgins	C. T. C. Barker, E. S. Simpson	3	14	3	Calcutta, China, Java, Manilla, Japan, California, Japan, California, British Columbia, Samoa, Australia, New Zealand, *viâ* Suez.
"Clan Macintosh," S.S.	W. J. Lennox	— Wright, — Horn, — Easterbrook, — Hocking, — Butcher, — Harvey, — Coppin, — Stenson, — Jackson, — MacKenzie.	2	6	13	Durban, Mauritius, Bombay, Chittagong, *viâ* Cape and Suez.
"Clan Macintyre," S.S.	A. R. Weir	G. P. Phillips, W. Crichton, T. W. Commander, M. I. Pirie, H. Penney, H. M. Ryder.	2	6	16	Natal, Mauritius, Australia, New Zealand, Chittagong, *viâ* Cape and Suez.
"Clan Macleod," S.S.	H. G. Fishenden, Lieut. R.N.R.	H. S. Southward, G. C. Matthews, J. B. Young, G. C. Macey, H. V. Wen.	2	7	28	Calcutta, Monte Video, New Zealand, Makassar, Saigon, *viâ* Capes and Suez.
"Clan Urquhart," S.S.	C. Sommerfelt	T. W. Young, J. Robson, J. R. Letts, C. T. Nicoll.	2	6	2	Bombay, Calcutta, *viâ* Suez.
"Clyde," S.S.... ...	A. P. Dix, Lieut. R.N.R.	F. Bateman, A. W. Hudson, W. F. Bulleid, R. E. L. Treweeks, J. E. Atkins, Sub-Lieut. R.N.R.	2	10	0	River Plate, West Indies, Colon, New York.
"Cornwall," S.S. ...	W. Howell	A. C. Jarvis, T. N. Edge, A. MacRae ...	1	4	6	New Zealand, *viâ* C.G.H. and Magellan.
"Crown of Arragon," S.S.	G. Grindlay	J. A. D. Risk, A. Thomson, N. McCormack	3	5	28	Demerara, West Indies, Galveston, Quebec.
"Den of Ogil," S.S. ...	H. C. Hemming ...	E. Twidle, G. C. Reed, R. Hedworth ...	1	3	14	Calcutta, Christmas Id., *viâ* Suez.
"Derbyshire," S.S. ...	E. Robin	F. Beckett, H. Lyons, W. McGhie, J. Miller, R. Kellet.	4	8	0	Rangoon, *viâ* Suez.

"Druidstone," S.S. ...	S. W. Decent	H. Haynes, P. O. Hughes	1	1	26	Black Sea.
"Dunbarmoor," S.S....	W. B. Barton	W. Tate, A. P. Hamon, — Adams, T. H. Gale, J. H. Russell, B. F. Carrington.	8	7	20	Nicolaieff, Bombay, Karachi, *viâ* Suez.
"Dunottar Castle," S.S.	G. K. Gandy, R.D., Lieut. R.N.R.	A. H. Hutchings, E. Windsor, A. B. Black...	1	3	26	Norway, Mediterranean.
"Durham Castle," S.S.	F. J. Moseley, Commr. R.N.R. S. Henderson, R.D., Lieut. R.N.R. H. M. Cruise ... F. P. Whitehead, Lieut. R.N.R.	P. Durkin, Lieut. R.N.R., B. Ray, J. J. Kersey, A. J. Densham, E. C. Pilkington, Lieut. R.N.R.	8	7	16	Cape Town.
"East Point," S.S.	L. R. W. Beavis H. I. Young ...	— Young, — Sims, — Hadley	1	3	1	Philadelphia.
"Egypt," S.S. ...	F. R. Summers	D. Asbury, M. E. Dunston, C. Young, S. J. Woodroffe, S. Pearson, S. Marsden, J. Lilley.	2	8	2	Bombay, *viâ* Suez.
"Empress of China," S.S.	W. Davison, Lieut. R.N.R. R. Archibald, Commr. R.N.R.	F. W. N. Higgens, Lieut. R.N.R.	1	4	0	Trans-Pacific, Victoria, B.C., and Hong Kong.
"Empress of India," S.S.	E. Beetham, Lieut. R.N.R.	J. N. Day	1	3	8	Trans-Pacific, Victoria, B.C., and Hong Kong.
"Empress of Japan," S.S.	S. Robinson, Lieut. R.N.R. H. Pybus, Commr. R.N.R.	... ...	1	3	20	Trans-Pacific, Victoria, B.C., and Hong Kong.
"Eva Montgomery," Ship.	H. Docherty	J. L. Campbell, — Conroy	2	13	2	W.C. South America.
"Fulwell," S.S. ...	G. C. Douglas	R. Mallett, E. F. Newton	1	2	16	Calcutta, *viâ* Suez.
"Gio Batta Beverino," Barque.	G. B. Serra	... ...	1	5	23	New South Wales, W.C.S.A.
"Glamorganshire," S.S.	H. C. Norris	H. T. Angus, T. C. Morris, N. Colbridge ...	1	4	4	China, Japan, *viâ* Suez.
"Glen Affric," S.S. ...	W. Lane	H. A. Vicary, A. S. Whyte, S. Horne ...	1	2	15	Calcutta, Karachi, *viâ* Suez.
"Glenelg," S.S. ...	A. Hart	I. Millar, D. L. Muirhead, R. Brown, T. Thomas.	1	7	23	East Indies, United States, Madagascar, *viâ* Cape and Suez.
"Grace Harwar," Ship	E. Gates James, Lieut. R.N.R.	R. E. Borton, A. H. Seaton	1	6	7	Iquique.

METEOROLOGICAL REGISTERS received during the Year 1909-10—*continued.*

(3.)—*From the* MERCANTILE MARINE.—*Meteorological Logs*—continued.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
				Mths. Days.	
"Hesperian," S.S. ...	W. S. Main	D. M. Kelso	1	3 24	U.S.A., Canada.
"Hillmere," S.S. ...	A. M. Griffiths	I. Dawson, T. Moore, M. W. White	3	7 28	Rio, West Indies, Gulf of Mexico Wilmington, N.C.
"India," S.S.... ...	R. L. Haddock, Commr. R.N.R.	C. W. Burleigh, Lieut. R.N.R., E. C. Miller, Sub-Lieut. R.N.R., G. Lake, Sub-Lieut. R.N.R., H. P. Comyn, Sub-Lieut. R.N.R., T. A. Smith, F. C. Archer, A. Roddick, Sub-Lieut. R.N.R., R. H. Stringer, Sub-Lieut. R.N.R.	3	6 27	Australia, Bombay, *viâ* Suez.
"Ionic," S.S. ...	S. A. Anning, Lieut. R.N.R. E. C. Roberts ...	W. Paul, A. E. Bowles, T. Thomas, C. Alexandre.	3	8 28	New Zealand, *viâ* Capes.
"Jason," S.S.... ...	T. G. Steeves	G. J. B. Rogers, J. R. Scott	3	8 21	China, Makassar, Japan, Australia, *viâ* Suez, Cape.
"Julia Park," S.S. ...	M. Mackenzie	Jno. Thomson	2	5 27	Monte Video.
"Kaikoura," S.S. ...	A. W. McKellar, Lieut. R.N.R.	A. F. Beaton, N. J. Wilde, R. J. Gibb ...	1	3 1	New Zealand, *viâ* Capes.
"Kaipara," S.S. ...	N. R. de la C. Cornwall, Lieut. R.N.R.	G. Worthington, W. T. Point, G. Stedham...	1	2 26	New Zealand, *viâ* Capes.
"Keyingham," S.S. ...	J. W. Millican	I. Tweedie, A. Thompson	2	7 20	U.S.A., Mediterranean, E.C.S.A., Port Said.
"Kia Ora," S.S. ...	T. H. Chudley, Lieut. R.N.R.	— Lewis, — Kershaw, — Gaskell, — Clements.	1	3 17	New Zealand, *viâ* Capes.
"Kildonan Castle," S.S.	J. Tyson...	N. Aplin, J. McMahon, F. Tunbridge ...	2	6 27	Cape Town.
"Kincraig," S.S. ...	A. G. Reid	— Bassaers, — Paterson, — Bailey	1	1 [illegible]	[illegible]

"Kintail," S.S. ...	D. G. Griffiths	D. Kerr, R. McDougall, E. L. Thomas, F. Wilson, L. Wiseman.	2	4	18	Calcutta, Bassein, *viâ* Suez, Buenos Aires.
"Kumara," S.S. ...	A. Morton	H. S. Solomon, C. J. G. Gordon-Canning, Mid. R.N.R., A. S. Verity, J. Fisher, J. Wilson.	2	6	7	New Zealand, *via* Capes.
"Leander," S.S. ...	H. R. Ketley	J. H. Williams, T. Williams	1	3	23	Rosario, Archangel, Port Said.
"Le Coq," S.S.	F. W. Peterson	C. J. Bailey, O. S. Leech, J. Main J. Marrais	1	3	23	Kustendje, New York.
"Leicestershire," S.S.	G. H. Harris, Lieut. R.N.R.	— Blanchard, — Bergen, — Turnour, — Wood, — Smarden, — Boyce.	2	4	4	Rangoon, *viâ* Suez.
"Loch Torridon," Barque.	R. Pattman	F. J. White	1	6	7	Australia, *viâ* Capes.
"Lusitania," S.S. ...	W. T. Turner	W. Wingate, Sub-Lieut. R.N.R.	1	3	4	New York.
"Macduff," S.S. ...	C. H. Burch	— Cook, — Clark, — Gay, — Kidley ...	1	3	12	Saigon to Bombay, Mauritius, Calcutta.
"Macedonia," S.S. ...	C. D. Bennett, R.D., Commr. R.N.R.	A. H. Ayres, Sub-Lieut. R.N.R., M. Garwood, C. Roddick, F. E. French, Sub-Lieut. R.N.R., G. G. Randall, E. P. Lyndon.	3	8	3	Bombay, China, Australia, *viâ* Suez.
"Magdalena," S.S. ...	W. H. B. Trigge, Lieut. R.N.R.	A. Thompson, L. F. Drake, T. W. H. Hosegood, P. Gould, H. L. Jenkins.	1	3	11	West Indies, New York.
"Majestic," S.S.	F. E. Beadnell, Lieut. R.N.R. / B. F. Hayes, R.D., Commr. R.N.R.	J. Bertenshaw	1	4	1	New York.
"Manchester Corporation," S.S.	P. J. Heath	H. Wilkinson, — Cabot, F. Clough	1	3	22	Philadelphia.
"Manchester Exchange," S.S.	T. A. Adamson	G. M. Mitchell, T. A. Brooks, C. L. Whorrall	1	3	24	Mobile, New York, E.C.S.A., Florida.
"Manica," S.S.	F. O. Potts	S. C. Walton, L. W. T. Lewis, V. H. Harding, E. W. Manship, D. T. Edwards.	2	7	16	Seychelles, *viâ*, Cape, Calcutta, Saigon, Boston, U.S.A., *viâ* Suez.
"Manistee," S.S. ...	W. J. Forrester... ...	F. G. Downes, J. M. Isaacson, R. A. Thorburn, Mid. R.N.R., L. Sinclair, W. A. Williamson, V. F. Sizer.	2	7	2	Port Limon.
"Maori," S.S. ...	G. Nicole	A. C. Read, J. Pearce, Sub-Lieut. R.N.R., C. A. Rowlinson, Lieut. R.N.R., C. W. Probyn. Mid. R.N.R.	1	1	20	Buenos Aires.
"Marere," S.S. ...	J. Firth	P. E. Mells, F. A. Renaut, R. S. Durham, C. H. Purkis, F. G. Williams, N. S. Marks.	2	5	16	Australia, *viâ* Capes and Suez.

METEOROLOGICAL REGISTERS received during the Year 1909-10—*continued.*

(3.)—*From the* MERCANTILE MARINE.—*Meteorological Logs*—continued.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
				Mths. Days.	
"Marion Josiah," Ship.	J. MacDonald	W. G. Corkill, J. Pollok	2	14 18	Australia, W.C.S.A., *viâ* Capes.
"Mars," S.S.	T. A. Tait	I. P. Downs, R. Anderson, C. Greenham ...	1	3 26	Cape, Pondicherry, U.S.A., *viâ* Suez.
"Matina," S.S. ...	F. H. Swain	A. E. Johnson, L. H. Sinclair, C. Hake, F. C. Hamilton, V. F. Sizer, A. D. Young.	3	8 8	Central America.
"Miami," S.S. ...	E. W. Castle	A. D. Riseley, D. R. Cooke, R. H. Langston	1	3 6	Port Limon.
"Mimiro," S.S. ...	A. H. Kemp	I. D. Farmilo, I. E. Clayton, H. E. Martin, — Robinson.	2	6 22	Australia, New Zealand, *viâ* Capes and Suez.
"Minia," S.S. ...	W. G. S. De Carteret ...	P. D. Bates, J. N. Tinniswoode, S. H. Davis	2	8 20	Cable work, N.A.
"Monarch," S.S. ...	J. Wrake	E. R. Hutchons, Sub-Lieut. R.N.R., G. Flavel, Lieut. R.N.R., S. G. Gorton.	2	4 13	Cable work, United Kingdom Coasts.
"Monmouth," S.S. ...	H. G. Kendall, Lieut. R.N.R.	E. W. Matthews	1	3 10	Canada.
"Monmouthshire," S.S.	G. E. Warner, Lieut. R.N.R.	A. M. K. Saul, A. W. Taylor, K. D. Shoesmith.	1	3 27	China, Japan, *viâ* Suez.
"Mooltan," S.S. ...	G. C. Henning, Commr. R.N.R.	L. D. B. Clayton, S. C. Patterson, Lieut. R.N.R., J. M. Tickell, E. H. Orchard, Lieut. R.N.R., P. G. Plumbly, Sub-Lieut. R.N.R., A. Bolderstone, W. A. Baker, H. F. Sedgwick, E. F. McLeod, C. A. Black.	4	9 27	Australia, *viâ* Suez.
"Morning," S.S. ...	W. Adams	N. F. Sundholm	1	6 8	Davis Strait, Whaling.
"Ness," S.S.	T. McWilliams	G. Lee, H. R. Sargent, S. Loughnan, A. Montague.	3	6 7	Buenos Aires, Black Sea, U.S.A.
"Nicoya," S.S. ...	S. H. Simmons	D. McInnes, W. Brimecombe, W. G. Preece, W. J. Geh, T. A. Thwaite.	2	7 5	Port Limon.
"Niwaru," S.S. ...	H. Hollis	J. E. L. Compton, B. Sherrington, C. A. Robinson, Mid. R.N.R., V. E. Armstrong, F. C. Greenwood, Mid. R.N.R.	2	6 20	Australia, New Zealand, *viâ* C.G.H.

[illegible]	H.N.	E. Young.					nople, Calcutta, viâ Cape.
"Nubia," S.S. ...	F. J. Fox	R. Johnes-Smith, A. Keith-Yates	3	3	3	China, Japan, Calcutta, *viâ* Suez.
"Olympia," S.S. ...	A. Tait	G. Guthrie, G. S. Salmon, W. D. Butler, N. J. Doig, J. P. M. H. Martin.	1	3	20	Bombay, *viâ* Suez.
"Omrah," S.S. ...	W. S. Shelford, Lieut. R.N.R.	H. Seale, A. Fielding, Lieut. R.N.R., F. R. O'Sullivan, R. C. Glasebrook, Lieut. R.N.R., H. G. Thomson, Sub-Lieut. R.N.R., C. W. Stevens, Lieut. R.N.R., A. H. Fraser, Lieut. R.N.R., H. A. Deane.	3	7	14	Australia, *viâ* Suez.
"Ophir," S.S.	A. J. Coad, Commr. R.N.R. J. F. H. Healey, R.D., Lieut. R.N.R. H. G. Staunton, Lieut. R.N.R.	R. W. I. Marshall, Sub-Lieut. R.N.R., H. V. Hart, Lieut. R.N.R., H. Phillips, Lieut. R.N.R., R. B. Thomson, Lieut. R.N.R.	3	7	10	Australia, *viâ* Suez.
"Orari," S.S.	J. P. Forsdick	P. G. Hyde, A. Willes, F. Pattinson... ...	1	2	28	New Zealand, *viâ* Capes.
"Orient," S.S. ...	H. G. Staunton, Lieut. R.N.R.	H. G. Adams, L. V. James, C. T. Keigwin, Lieut. R.N.R., A. L. Owens, Sub-Lieut. R.N.R., M. J. Parcon.	2	4	28	Australia, *viâ* Suez.
"Ormuz," S.S.	P. N. Layton, Lieut. R.N.R. J. Avern, Sub-Lieut. R.N.R.	H. C. Brewster, Lieut. R.N.R., H. D. Groom, G. F. Parsons.	2	5	14	Australia, *viâ* Suez.
"Orontes," S.S.	J. F. Ruthven, A.I.N.A., F.R.G.S., &c. D. R. W. Parsons, Lieut. R.N.R.	L. A. Brooke-Smith, Lieut. R.N.R., V. Seymour, Sub-Lieut. R.N.R., E. P. Cameron, Sub-Lieut. R.N.R., C. J. R. Webb, Sub-Lieut. R.N.R.	2	5	29	Australia, *viâ* Suez.
"Orsova," S.S.	J. F. Ruthven, A.I.N.A., F.R.G.S., &c. D. R. W. Parsons, Lieut. R.N.R.	F. R. O'Sullivan, I. N. Jones, H. T. M. Watkins, Lieut. R.N.R., W. Gordon-Bennett.	2	4	28	Australia, *viâ* Suez.
"Osterley, S.S. ...	W. J. Jenks	A. Fielding, Lieut. R.N.R., L. V. James, B. Blecher, H. S. Gillett, Sub-Lieut. R.N.R.	1	2	13	Australia, *viâ* Suez.
"Otaki," S.S.	L. G. Silba	H. Wynyard, H. L. Penny, C. Gavegan, Sub-Lieut. R.N.R., L. Rose, J. Aitken.	2	6	16	New Zealand, *viâ* Capes.

METEOROLOGICAL REGISTERS received during the Year 1909-10—*continued.*

(3.)—*From the* MERCANTILE MARINE.—*Meteorological Logs*—continued.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.		Voyage.
				Mths	Days.	
"Otway," S.S. ...	F. S. Symons	E. E. Smith, J. L. Marshall, Sub-Lieut. R.N.R.	2	4	24	Australia, *viâ* Suez.
"Pacuare," S.S. ...	J. H. H. Scudamore, Lieut. R.N.R.	R. B. Drake, H. Ashley, H. A. Deane, P. H. Day, A. N. Newitt, O. Pitts.	2	6	12	Port Limon.
"Pakeha," S.S ...	L. B. Gillman	R. A. Kelly, L. D. McKirdy, Sub-Lieut. R.N.R., E. Calvert.	1	4	13	New Zealand, *viâ* Capes.
"Palma," S.S. ...	G. W. Cookman, R.D., Commr. R.N.R.	P. L. Sandberg, W. H. Davies, W. A. Blomfield, Mid. R.N.R., A. P. Gunston, Mid. R.N.R., E. G. Fryer, Mid. R.N.R., C. O. Clifford.	2	7	13	China, Japan, Australia, *viâ* Suez.
"Peerless," S.S. ...	H. Cook	C. Vickers	3	8	28	Monte Video, Pensacola, New Orleans.
"Pericles," S.S. ...	A. Simpson, F.R.Met. Soc.	P. C. Collins, E. Legge, O. File, W. Case, J. Jackson.	2	5	17	Australia, *viâ* Cape of Good Hope.
"Port Antonio," S.S.	A. C. Selfe, Lieut. R.N.R. W. R. Rowe, F.R.Met. Soc.	G. A. Griffin, C. L. Woollard, Sub-Lieut. R.N.R., J. N. Rodick, Sub-Lieut. R.N.R., G. K. Evans, J. B. Fleet, Mid. R.N.R., A. E. Harvey.	2	5	4	Jamaica.
"Port Henderson," S.S.	W. R. Rowe, F.R.Met. Soc.	G. K. Evans, C. L. Woollard, Sub-Lieut. R.N.R., J. B. Fleet. Mid. R.N.R., G. R. Hudson. Lieut. R.N.R., A. E. Harvey.	3	9	14	Jamaica.
"Port Kingston," S.S.	O. Jones	H. G. B. Bentley, Sub-Lieut. R.N.R. ...	2	6	24	Jamaica.
"Port Royal," S.S. ...	A. C. Selfe, Lieut. R.N.R.	G. A. Griffin, A. W. Creese, G. Terry, Sub-Lieut. R.N.R.	1	1	27	Jamaica.
"Potosi," S.S. ...	A. T. D. Pearson ...	— Jones, — Metcalf, — Flinn	1	5	11	W.C.S.A.
"Ramsay," S.S. ...	F. C. Mullan, F.R.G.S. ...	R. Bailey, A. Edwards, F. S. Hamilton ...	3	9	3	Rio Janeiro, Black Sea, U.S.A., West Indies, Natal, Manila, Manchuria, *viâ* Cape and Suez.

"Ryde," S.S.	E. F. Smith ... W. G. Diver	R.N.R., A. McKinstry, D. Gordon Stevens. J. E. Turner, J Granger	1	3	27	Monte Video, Mobile.
"Saxon Prince," S.S.	R. Kirkwood	T. Jennings, R. Milliken, J. Smith, W. Milroy, T. H. Hamilton.	2	5	0	New York, New Orleans, River Plate.
"Scotia," S.S. ...	T. Robertson, F.R.S.G.S.	W. S. R. Robertson	1	4	10	Greenland Seas, Whaling.
"Segura," S.S. ...	R. Hayes	H. W. Robson, F. L. Tongue, Sub-Lieut. R.N.R., A. E. Gudgeon.	1	3	24	China, Japan, *viâ* Suez.
"Shadwell," S.S.	J. T. Douglas ... W. H. Knox ...	J. W. Bolam, J. McGreivy, R. Mallett, C. C. Lee, G. J. Cooper, A. Brewis.	3	7	9	Calcutta, *viâ* Suez.
"Shira," S.S.	J. Cann	F. Carter	2	4	17	East Indies, U.S.A., *viâ* Suez.
"Singapore," S.S. ...	L. F. Taylor, Lieut. R.N.R.	W. S. Fish	1	1	27	Para, Tampa.
"Suevic," S.S. ...	C. E. Starck, Lieut. R.N.R.	F. F. Steele, H. Pawley	1	2	26	Australia, *viâ* C.G.H.
"Tagus," S.S. ...	W. G. Mason	R. H. Kitson, G. B. Gedge, W. Weller, A. Thompson, D. Henderson, C. Hadow, S. Dean.	2	6	23	Central America, U.S.A.
"Tintagel Castle," S.S.	W. W. Verrall, Lieut. R.N.R.	G. R. Parker, Sub-Lieut. R.N.R., E. S. Vincent, Lieut. R.N.R., C. F. Brown, Sub-Lieut. R.N.R., C. Steer, F. M. Miller, R. Dodsworth.	4	10	1	Cape Ports, Mauritius, Beira.
"Tongariro," S.S. ...	I. A. Sutcliffe	J. S. Cairns, A. Rivers, R. B. O'Brien, C. W. J. Nursey, J. Moffatt, Sub-Lieut. R.N.R., P. Ballard.	3	8	27	New Zealand, *viâ* Capes.
"Waimate," S.S. ...	J. J. Cameron, Lieut. R.N.R.	W. Field Hook, C. W. J. Nursey, J. Moffatt, Sub-Lieut. R.N.R., T. M. Stephenson, — Hamilton.	2	7	6	New Zealand, *viâ* Capes.
"Wakanui," S.S. ...	V. C. White-Parsons ...	S. Vine, O. P. Crawford, H. L. Upton, P. M. Black.	1	3	12	New Zealand, *viâ* Capes.
"Wakool," S.S. ...	W. G. Lingham, F.R.A.S., F.R.Met. Soc.	N. E. Ritson, H. Ashby, H. Carson	1	4	0	Australia, *viâ* C.G.H.
"Wandsworth," S.S....	W. H. Bloomfield ...	A. C. Bucknell, D. McNeil, W. J. Hall ...	2	5	20	Tenerife, River Plate, Savannah.
"Waverley," S.S. ...	H. R. Wheatley ...	R. Robertson, P. Henderson, P. Frazer ...	2	3	20	Mediterranean, U.S.A.
"Whakatane," S.S. ...	F. A. Hemming ...	— Bradshaw, — Rose, — Stevenson ...	1	3	14	New Zealand, *viâ* Capes.

METEOROLOGICAL REGISTERS received during the Year 1909-10—*continued.*

(3.)—*From the* MERCANTILE MARINE.—*Meteorological Logs*—continued.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
				Mths. Days.	
"Wilcannia," S.S.	W. G. Lingham, F.R.A.S., F.R.Met. Soc. F. W. A. Hanson, Lieut. R.N.R.	A. Grove, Sub-Lieut. R.N.R., G. D. Turner, D. E. Hotchkin, I. M. Pougnet, T. C. Bayard, W. T. Williams.	3	12 10	Australia, *viâ* C.G.H.
"Winkfield," S.S. ...	I. Watson	— Howell, — Adams, — McCourt	1	4 27	East Indies, Australia, W.S.C.A., *viâ* Suez and Cape Horn.
"Worcestershire," S.S.	G. H. Harris, Lieut. R.N.R.	— Travis, — Bryce, — English, — Bromley	1	2 3	Rangoon, *viâ* Suez.
"York Castle," S.S. ...	E. Mais	F. A. Smyth, Sub-Lieut. R.N.R., H. R. Northwood, J. Bishop.	1	4 6	New York, Beira, Baltimore, *viâ* C.G.H.
"Zent," S.S.	J. G. Parsons	G. W. Petheram, R. H. Smith, V. F. Sizer, G. D. V. Creagh.	2	7 6	Central America.

(4.)—ABBREVIATED METEOROLOGICAL REGISTERS.

(a.) *From the Royal Navy* (—).

(b.) *From the Mercantile Marine* (10).

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
				Mths. Days.	
"Arana," S.S	R. Walton	G. A. Simpson, W. C. Ashton, W. B. Richardson	6	3 29	Mediterranean.
"Mascotte," Barque ...	G. B. Serra	... ...	1	1 15	Monte Video.
"Moresby," S.S. ...	F. J. Bayldon, Lieut. R.N.R.	... ...	2	2 4	Between Brisbane and Solomon Islands.
"Sabine," S.S. ...	S. H. Owen	N. C. Wright	1	2 28	Cape to St. Paul's Id.

METEOROLOGICAL REGISTERS received during the year 1909–10 —*continued.*

5.)—NORTH ATLANTIC REGISTERS—FORM No. 121 (1,884).

INDIAN OCEAN REGISTERS—FORM No. 122 (275).

RADIOTELEGRAPHY REGISTERS—FORM No. 138 (515).

Ships from which Radiotelegraphy Registers have been received are shown by the symbol †.

Line.	Ship.	Captain and No. of Registers.
ala S.S. Co. ...	Alala	B. B. Griffiths, 1.
lan	Carthaginian	R. G. Bamber, 2.
	Corinthian ...	W. Dunlop, A. Rennie } 12.
	†Corsican	J. T. Gambell, 40.
	Grampian ...	J. M. Johnston, J. T. Gambell } 20.
	Hesperian	W. S. Main, 24.
	Hibernian	G. Hamilton, 11.
	Ionian	B. T. Eastaway, 12.
	Laurentian	H. Imrie, 8.
	Mongolian	J. Williams, 6.
	Numidian	T. Moar, 20.
	Ontarian ...	A. J. Peters, G. Hamilton } 4.
	Orcadian	D. Tannock, 2.
	Pomeranian	J. Henderson, 13.
	Pretorian	E. Pitts, Commr. R.N.R., R.D., 18.
	Sardinian	B. Henry, 16.
	Siberian	D. Tannock, 2.
	Sicilian	W. Wallace, 10.
	†Tunisian	J. A. Fairfull, 32.
	Ulunda	F. W. Chambers, 2.
	†Victorian	E. Outram, 30.
	†Virginian	A. H. Vipond, 30.
rican	Friesland ...	J. Davies, J. Evans } 9.
	Haverford	J. H. A. Thornton, 20.
	Merion	J. B. Hill, 10.
	†New York	W. J. Roberts, 21.
	†Philadelphia	A. R. Mills, 22.
	†St. Louis	J. C. Jamison, 32.
	†St. Paul	F. M. Passow, 19.
hor	Algeria	P. McLean, 2.
	†Caledonia ...	W. Baxter, J. Wilson } 24.
	†California	J. Blaikie, 5.
	Circassia	C. F. Osborne, Commr. R.N.R., R.D., 10.
	†Columbia	F. H. Wadsworth, 7.
	Dalmatia ...	J. Black, W. Mitchell } 6.
	Elysia	A. Haig, 6.
	†Furnessia ...	J. Lumsdane, J. Black, W. Mitchell } 18.
	Olympia	A. Tait, 16.
	Scindia	W. Kelso, 16.
Arana" S.S. Co. ...	Arana	R. Walton, 14.
lantic Transport ...	Mackinaw ...	O. P. Clarke, G. L. Goudie } 11.
	Manhattan	W. Johnston, 2.
	Marquette	A. E. Tribe, Lieut. R.N.R., 3.
	Maryland	J. McMath, 8.

METEOROLOGICAL REGISTERS received during the year 1909–10 —*continued.*

Line.	Ship.	Captain and No. of Registers.
Atlantic Transport—*cont.*	Mesaba	O. P. Clarke / F. H. Claret, Lieut. R.N.R. } 10.
	†Minneapolis	F. H. Claret, Lieut. R.N.R., 28.
	†Minnehaha	S. Layland, 32.
	Minnesota ...	P. Laverock / H. B. Pope } 9.
	†Minnetonka	E. G. Cannons, 32.
	†Minnewaska	T. F. Gates, 38.
	Mobile	J. T. J. Wylie, 10.
	Montana	P. Laverock, 14.
Austin Friars S.S. Co.	Haileybury	G. H. Sheppard, 3.
Bibby	Leicestershire	G. H. Harris, Lieut. R.N.R., 10.
	Worcestershire	G. H. Harris, Lieut. R.N.R., 7.
Birt, F. B.	Suffolk	G. T. Deith, 3.
Bolton S.S. Co. ...	Ramsay	F. C. Mullan, F.R.G.S., 1.
Booth	Anselm	A. MacKenzie, 6.
	Boniface...	R. G. M. Williamson, 8.
	Hilary	A. W. Stoker / E. J. Collings } 4.
	Marenhense	E. Robinson, 3.
Bowring, C. T. & Co.	Brika	E. E. Cooper, 1.
Bristol "City" ...	Chicago City	W. M. Hunter, 12.
British and Burmese	Martaban	W. Duguid, 9.
	Pegu	W. Morris, 8.
British India ...	Colaba	J. Robertson, Lieut. R.N.R., 10.
	Culna	S. Maclachlan / J. Farquharson } 12.
Brocklebank	Malakand	T. G. Legg, 2.
Bucknall	Buceros	J. Hutcheon / W. Keasley } 2.
	Karonga...	R. Leslie, 2.
	Kasenga	A. W. Dobbs, 1.
	Katuna	A. Lee. 12.
	Koranna...	J. H. Beare, 6.
Buenos Ayres Great Southern Railway Co.	Alfalfa	A. Osmond, 4.
Cairn	Fremona...	J. Cunningham, 3.
Canadian-Pacific Railway Co.	†Empress of Britain ...	J. A. Murray, 41.
	†Empress of Ireland ...	J. V. Forster, Lieut. R.N.R., 17.
	†Lake Champlain ...	G. S. Webster, Lieut. R.N.R., 23.
	†Lake Erie	F. Carey, 17.
	†Lake Manitoba... ...	G. C. Evans, 22.
	†Lake Michigan ...	C. Troop / H. Parry } 22.
	Milwaukee	E. Griffiths, Lieut. R.N.R., 1.
	†Monmouth	H. G. Kendall, Lieut. R.N.R., 7.
	†Montcalm	C. W. Hodder, 22.
	†Montezuma ...	H. G. Potter / A. E. Evans } 10.
	†Montfort	A. E. Evans, 12.
	†Montreal	R. H. McNeill, 9.
	†Montrose ...	H. G. Potter / H. Parry / E. Griffiths, Lieut. R.N.R. } 7.
	†Mount Royal ...	C. Troop / A. Parcells } 8.
	†Mount Temple	J. H. Moore, 19.
Clan	Clan Macintosh ...	W. J. Lennox, 9.
Clyde S.S. Co. ...	Spithead...	E. C. Tuckwell, 1.
Compagnie Générale Transatlantique.	La Provence	E. Poncelet, 4.
"Crown" S.S. Co. ...	Crown of Navarre ...	A. McKillop, 6.

Meteorological Registers received during the year 1909–10 *—continued.*

Line.	Ship.	Captain and No. of Registers
Cunard	Aleppo	W. C. Crathorne, Lieut. R.N.R., 1.
	Brescia	G. W. Melsom, Sub-Lieut. R.N.R., 10.
	†Campania ...	J. T. W. Charles, Commr. R.N.R., R.D. R. C. Warr C. A. Smith, Commr. R.N.R., R.D. } 28.
	†Carmania	J. C. Barr, 33.
	†Caronia	D. Dow, Commr. R.N.R., R.D., 24.
	Carpathia	C. A. Smith, Commr. R.N.R., R.D., 12.
	Cherbourg	C. Morison, 6.
	Cypria	H. N. Goulden, 3.
	†Ivernia	H. M. Benison, Lieut. R.N.R. T. Potter } 33.
	Lucania	R. C. Warr, 2.
	†Lusitania ...	J. B. Watt W. T. Turner J. T. W. Charles, Commr. R.N.R., R.D. } 32.
	Lycia	G. F. Jeffries, 2.
	†Mauretania ...	J. Pritchard W. T. Turner } 32.
	Pannonia	W. R. D. Irvine, Lieut. R.N.R., 17.
	Pavia	G. F. Jeffries H. M. Benison, Lieut. R.N.R. } 7.
	Saragossa	G. W. Melsom, Sub-Lieut. R.N.R., 9.
	†Saxonia	E. H. Pentecost, Commr. R.N.R. J. T. W. Charles, Commr. R.N.R., R.D. } 28.
	Sylvania	W. B. Cresser, Lieut. R.N.R., 2.
	Tyria	W. C. Crathorne, Lieut. R.N.R. W. B. Cresser, Lieut. R.N.R. } 10.
	Ultonia	C. A. Smith, Commr. R.N.R., R.D., 9.
	†Umbria	R. C. Warr D. S. Miller, Lieut. R.N.R. J. T. W. Charles, Commr. R.N.R., R.D. } 9.
	Veria	G. W. Melsom, Sub-Lieut. R.N.R., 12.
"Devona" S.S. Co. ...	Devona	D. R. Murray, 12.
Dominion	†Canada	R. O. Jones, 39.
	Cornishman ...	E. Maddox J. H. A. Thornton } 15.
	†Dominion	W. L. Mendus, 14.
	Irishman	— Moorhouse. 1.
	Ottawa	J. Evans, 8.
	Ottoman	T. Deans, 3.
	Vancouver	? , 2.
	Welshman	T. Howell, 8.
Elder, Dempster ...	Port Antonio ...	W. R. Rowe A. C. Selfe, Lieut. R.N.R. } 14.
	Port Henderson ...	W. R. Rowe, F.R. Met. Soc., 16.
	Port Kingston	O. Jones, 20.
	Port Royal	A. C. Selfe, Lieut. R.N.R., 6.
Elders & Fyffes ...	Barranca	W. Long, 12.
	Manistee	W. J. Forrester, 16.
	Matina	F. H. Swain A. E. Johnson } 4.
	Nicoya	S. H. Simmons, 14.

METEOROLOGICAL REGISTERS received during the year 1909-10 —*continued.*

Line.	Ship.	Captain and No. of Registers.
Elders & Fyers—*cont.*	Pacuare	J. H. H. Scudamore, Lieut. R.N.R., 6.
	Reventazon	J. Clarke, 14.
	Zent	J. Parsons, 16.
Ellerman	City of Athens ...	J. Wilson } 3. W. Knaut }
	City of Benares ...	? , 4.
	City of Glasgow ...	W. Greenhorn, 1.
	City of Manchester ...	H. Findlay, 12.
	Crosby Hall	T. Field, 7.
Elswick S.S. Co. ...	Elswick Grange ...	G. Wilson, 11.
English & American Shipping Co.	Gafsa	G. Boulter, 2.
	Pola	W. R. Bennett, 6.
(Danish)	Dania	P. Petersen, 9.
Gulf Transport ...	Ikbal	E. S. Pearse, 1.
	Imani	S. C. Penberthy, 8.
	Imaum	G. Wigdahl, 2.
	Indore	E. S. Pearse } 2. F. Jackson }
	Inkula	E. A. Alcide, 11.
	Inkum	W. E. Price, 3.
	Irak	A. Delargy, 5.
	Iran	T. B. Peabody, 7.
	Istrar	C. M. M. Jacob, 9.
H.M.S.	Terror	R. H. Fanshaw, Commr. R.N., 15.
Hardy, R.	Headlands	H. Lugg, 2.
Harrison	Author	G. N. Kearne, 9.
	Barrister	F. E. Westhorpe, 1.
	Civilian... ...	P. Lord } 9. G. Goldman }
	Counsellor ...	D. G. Cownie } 9. P. Lord }
	Custodian	D. G. Cownie, 9.
	Engineer	W. Llewellyn, 4.
	Historian	H. H. Pyle, 14.
	Huntsman	C. S. Rhodes, 14.
	Matador	W. T. Simmon, 2.
	Musician	G. B. Woolfenden, 2.
	Navigator	F. E. Westhorpe, 4.
	Tactician	R. Owen, 12.
	Traveller	G. N. Kearne, 1.
	Warrior	A. B. Sandiford, 3.
"Hurona" S.S. Co. ...	Hurona	J. Dorward } 13. O. Ritchie }
Indian S.S. Co. ...	Orwell	D. C. Horne, 1.
(Italian)	Silverstream	D. Garziono, 1.
Kish S.S. Co.	Simonside	— Pick, 1.
Laing S.S. Co. ...	Langdale	F. R. Clarke, 9.
Leyland, F.	Albanian	C. E. Harrison, 1.
	Almerian	E. Cook, 2.
	Antillian	W. Japha, 9.
	Armenian	J. Jacobsen, 3.
	Asian	W. E. Wood, 4.
	Atlantian	A. H. Highton, 9.
	Barbadian ...	G. H. Willis } 10. J. Macdonald } G. H. Manning }
	Bohemian	R. McCullum, 7.
	Bostonian	J. Parry, 6.
	Belgian	G. Williams, 3.
	Californian ...	B. Bruce } 4. F. A. Parkin }
	Cestrian	E. Thomas, 4.

METEOROLOGICAL REGISTERS received during the year 1909–10 *—continued.*

Line.	Ship.	Captain and No. of Registers.
Leyland, F.—*cont.*	Colonian...	T. Chadwick, 5.
	Cuban	T. W. Lofthouse, W. Masters } 9.
	Devonian	A. W. V. Trant, 1.
	Georgian	W. E. Wood, 4.
	Iberian	T. B. Jago, 16.
	Indian	B. Bruce, 2.
	Jamaican ...	J. Robb, B. Bruce, P. T. Reid } 4.
	Meltonian	A. Parker, 4.
	Michigan	S. W. Watkins, 2.
	Oxonian...	W. Dickinson, 2.
	Philadelphian ...	J. Gardner, R. D. George } 9.
	Tampican	W. Roberts, 8.
	Victorian ...	T. J. Kearney, E. C. Hiscox } 5.
	Winifredian	F. Shepherd, 6.
Leyland Shipping Co.	Planet Neptune ...	W. E. Price, 3.
Manchester Liners ...	Manchester Corporation	P. J. Heath, 10.
Meek, H. D.	Keyingham	J. W. Millican, 4.
Mercantile S.S. Co. ...	Lena	S. G. Dale, 3.
Nederland	Kawi	N. Guthrie, W. Bagchus } 4.
	Koning Willem II. ...	J. Teensma, 2.
	Sindoro	W. Bagchus, 9.
	Tabanan	N. Guthrie, 4.
	Vondel	J. Teensma, 5.
Nippon Yusen Kaisha	Sanuki Maru	K. Homma, 2.
Norddeutscher Lloyd	Bremen	E. Von Borell, 1.
	Seydlitz	A. Ahlborn, 3.
Norfolk and North American S.S. Co.	Crown Point ...	J. Wall, J. C. Walker } 10.
(Norwegian)... ...	Akershus	J. Martin, 1.
Peninsular and Oriental.	Assaye	O. Jones, Commr. R.N.R., RD., 9.
	Banca	A. Collyer, Lieut. R.N.R., 3.
	Borneo	W. H. S. Hall, 1.
	Egypt	F. R. Summers, 18.
	Mongolia	C. F. Preston, Commr. R.N.R., 8.
	Nile	E. P. Martin, Lieut. R.N.R., 12.
	Nyanza	H. S. Bradshaw, 6.
	Persia	W. H. Haughton, Commr. R.N.R., 15.
	Salsette	H. G. H. Lewellin, Lieut. R.N.R., W. Hayward, Lieut. R.N.R. } 9.
	Sumatra...	C J. Benton, Lieut. R.N.R., 1.
Prince...	African Prince	C. B. Andersson, 1.
	Black Prince	J. Thomas, 4.
	British Prince... ...	P. A. Johnston, 2.
	Moorish Prince... ...	H. R. Oliver, Lieut. R.N.R., R.D., 1.
	Norman Prince... ...	W. E. Barrett, 2.
	Saxon Prince	R. Kirkwood, 5.
	Welsh Prince	A. B. W. Sheppard, Lieut. R.N.R., 2.
Pyman S.S. Co. ..	Waverley	H. R. Wheatley, 10.
Red Star	†Finland	J. C. C. Moller, 9.
	†Kroonland ...	J. C. C. Moller, T. Bradshaw } 9.
	†Lapland	H. Doxrud, 19.
	†Vaderland	T. J. Barman, 41.
	†Zeeland	J. S. Ball, 10.

METEOROLOGICAL REGISTERS received during the year —*continued.*

Line.	Ship.	Captain and No. of Reg
Rotterdam Lloyd ...	Besoeki	K. Havinga, 1.
	Goentoer ...	M. van der Putte, P. De Boer } 12.
	Kediri	K. A. Bunge, 2.
	Tambora...	W. Bagchus, 1.
Shakespear S.S. Co....	Ovid	L. Cubitt, 1.
Star	Star of Canada	J. M. Hart, 1.
	Star of Scotland ...	J. M. Hart, 2.
Telegraph Construction and Maintenance Co.	Cambria...	J. R. Leach, 2.
Thomson, W. ...	Benarty	J. D. Sarchet, 8.
	Bengloe	W. A. Guy, 1.
	Benlarig	A. Wallace, 2.
	Benvenue	R. Kroble, 5.
Trechmann S.S. Co.	Frieda	R. C. Hill, 4.
	Wilster	T. Martin, 6.
Tyzack & Branfoot S.S. Co.	Camberwell	J. F. Henderson, 11.
Ulster S.S. Co. ...	Bengore Head ...	W. J. Finlay, — Pritchard, — Ferguson } 9.
Union-Castle ...	Dunottar Castle ...	G. K. Gandy, Lieut. R.N.
	Galeka	T. H. Wilford, 8.
	Guelph	J. N. Culverwell, L. A. Millard } 4.
	Kildonan Castle ...	J. Tyson, 5.
White Star	†Adriatic	E. J. Smith, Commr. R.
	Afric	F. B. Howarth, Lieut. R
	†Arabic	W. Finch, Lieut. R.N.R. H. S. Smith, Lieut. R.N
	†Baltic	J. B. Ranson, Lieut. R.
	Bovic	? , 5.
	†Cedric	C. A. Bartlett, Com R.N.R., R.D. J. O. Carter, Commr. R.
	†Celtic	A. E. S. Hambelto R.N R., 22.
	†Cretic	J. B. Kelk, 7.
	†Cymric	W. Finch, Lieut. R.N.R J. Mathias, Lieut. R.N.
	Georgic	W. H. Clarke, 2.
	†Laurentic	B. F. Hayes, Commr. R.N.
	†Majestic	F. E. Beadnell, Lieut. R
	†Megantic	H. S Smith, Lieut. R.N
	†Oceanic	H. J. Haddock, C.B., R. R.N.R., 22.
	†Romanic...	H. F. David, Lieut R.D., 14.
	†Teutonic... ...	R. Lobez, Lieut. R.N.R. R. W. James

APPENDIX V.

STRUMENTS supplied, &c., to the MERCANTILE MARINE.

Particulars.	Barometers.	Thermometers.	Hydrometers.	Screens.
t, 1909, afloat	165	1,199	698	202
l since	76	518	229	58
	241	1,717	927	260
ned since	35	261	100	17
	206	1,456	827	243
off as lost, &c.	—	286	47	30
t, 1910, afloat	206	1,170	780	210

)ISPOSITION of MERCANTILE MARINE INSTRUMENTS, April 1st, 1910.

Particulars.	Barometers.	Thermometers.	Hydrometers.	Screens.
hant ships	206	1,170	780	210
at M.O.	1	2	46	2
rpool Agency	2	30	8	5
row „	3	24	18	3
lee „	4	23	—	2
„	3	20	15	7
iff „	1	8	6	3
hampton „	4	20	20	4
erland „	2	9	7	3
al April 1st, 1910	226	1,306	900	239
epair, April 1st, 1910	2	25	—	—

UMENTS at STATIONS, viz.: Telegraphic Reporting Stations, Observatories, Fishing Villages, &c.

(*a.*) THERMOMETERS AND SCREENS.

	Thermometers.					
	Ordinary.	Maximum.	Minimum.	Solar.	Grass Minimum.	Screens.
t, 1909, in use ...	366	73	69	10	11	119
l since	50	6	7	—	1	1
	416	79	76	10	12	120
ned since	37	2	4	—	—	1
off	—	—	—	—	—	—
t, 1910, in use ...	379	77	72	10	12	119

APPENDIX VI.

ORT ON THE INSPECTION OF STATIONS IN CONNEXION WITH THE OFFICE IN 1909.

inspectors were as follows :—

cts 0, 1 and 6	Mr. A. Watt, Mr. H. Harries.
ct 2	Mr. R. G. K. Lempfert, Mr. A. Watt.
3	Mr. E. G. Constable.
4	Mr. R. G. K. Lempfert, Mr. A. Watt.
5	Captain Hepworth, Mr. R. Corless.
7	Mr. H. Harries.
8	Mr. T. W. Baker.
9	Mr. F. J. Brodie.
10	Mr. R. H. Curtis.
vatories and Anemograph ions.	Mr. T. W. Baker and Mr. E. G. Constable, by arrangement with the Director of the National Physical Laboratory; Mr. R. H. Curtis.

arrangement with the Scottish Meteorological Society, Mr. att was appointed as additional inspector for the year ending larch, 1910.

the observatories and anemograph stations the instruments dismounted and cleaned, and all necessary repairs were l out. At those observatories which are also climatological egraphic reporting stations the arrangements for this work examined.

reports show that efficiency has been maintained on the ; in a number of cases the inspectors were able to make stions for improving the observations by bringing them more ne with recognized conventions. Points requiring attention could not be settled on the spot have been dealt with by pondence.

following is a list of the stations visited :—

OBSERVATORIES.

Aberdeen.
Armagh.
Falmouth.
Glasgow.
Oxford.
Stonyhurst.
Valencia.

ADDITIONAL ANEMOGRAPH STATIONS.

wick Castle.
ghton.
erness.
ver.
blin (Phœnix Park).
etwood.
rleston.
lyhead.
Kingstown.
North Shields.
Pendennis Castle (Falmouth).
Plymouth.
Roche's Point.
Scilly.
Shoeburyness.
Yarmouth.

Normal Climatological Stations

Ampleforth.
Armagh.
Aspatria.
Belfast.
Belvoir Castle.
Birr Castle.
Cockle Park.
Colmonell.
Dublin (Phœnix Park).
Dumfries.
Dundee.
Dunrobin Castle.
Durham.
Garforth.
Geldeston.
Glasgow.
Hampstead.
Huddersfield.
Markree Castle.
Oban.
Plymouth.
Shrewsbury.
Southampton.
Stokesay.
Stonyhurst.
Tealby.
Tillypronie.

Auxiliary Climatological Stations

Alnwick Castle.
Balta Sound.
Bawtry.
Bradford.
Brighton.
Clifton.
Clongowes Wood College.
Foynes.
Kilkenny.
Killarney.
Kingstown.
Lancaster.
Lincoln.
Llangammarch Wells.
Mayfield.
Mountmellick.
Rauceby Hall.
Rothamsted.
Seaford.
Shoeburyness.
Tynemouth.
Wisley.

Telegraphic Reporting Stations.

Aberdeen.
Barra Island.
Bath.
Birr Castle.
Blacksod Point.
Donaghadee.
Dover.
Dungeness.
Holyhead.
Leith.
Malin Head.
Nairn.
North Shields.
Nottingham.
Oxford.
Portland Bill.
Roche's Point.
Scilly.
Spurn Head.
Stornoway.
Valencia.
Wick.

Miscellaneous Stations.

Cambridge (Newnham College, Hygrograph).
Lerwick (Barograph).
Limerick (Rainfall).

Mr. W. Marriott visited the following stations which are in connexion with the Royal Meteorological Society as well as with the Office :—

Bennington, Berkhamsted, Bognor, Bournemouth, Brighton, Cheltenham, Guernsey, Margate, Marlborough, Norwood, Portsmouth, Sandown, Shaftesbury, Swarraton, Tunbridge Wells, Ventnor, Weymouth, Worthing.

APPENDIX VII.

Geographical List of Institutions and Persons from whom Publications containing Meteorological Data have been received during the last Seven Years.

The list is arranged in accordance with the revised topographical classification adopted in the International Catalogue of Scientific Literature. *In each section the names of institutions which collect observations from a network of stations, or which publish observations on an extended scale, have been placed first.* In a number of instances, particularly in the case of tropical countries, observations are published by authorities not domiciled in the country. In these instances the names of the places of observation have been given as far as space permits, and the names of the institutions issuing the publications have been printed in *italic* type. If no names of places are quoted, it may be assumed that returns from a number of stations are given.

The character of the information available has been indicated by quoting the numbers in the International Catalogue under which the publications have been classified.

The year quoted is the last complete year for which the information has been received.

The classification numbers employed are as follows :—

1710 and 1730. Climatology—Agricultural and Hygienic.
1180. Rainfall Tables.
1800. Meteorological Observations—General.
1810. Hourly Values.
1820. Daily Values.
1825. Monthly and Yearly Mean Values.
1830. Daily Weather Reports.
1840. Weather Reports—Weekly, Monthly, &c.

† Indicates publications which give information for the upper air, obtained with balloons or kites.

Geographical List of Institutions and Persons supplying published Meteorological Data.

Name of Institution, &c.	Climatology—Agricultural and Hygienic. 1710 & 1730	Rainfall Tables. 1180.	Meteorological Observations—General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values. 1825.	Daily Weather Reports and Charts. 1830.	Weekly or Monthly 18
GENERAL.								
International Committee for Scientific Aeronautics, Strassburg.	—	—	1907	—	—	—	—	—
Board of Trade, London—Commercial, Labour, and Statistical Department.	—	—	—	—	—	1907	—	—
Symons's Meteorological Magazine ..	—	—	—	—	—	1909	—	—
d. **EUROPE AND MEDITERRANEAN SEA AND ISLANDS.**								
Deutsche Seewarte, Hamburg	—	—	—	—	—	—	—	190
da. **Scandinavia: Sweden, Norway, Denmark, Iceland, Faeroes:—**								
Dansk Meteorologisk Institut (Copenhagen).	—	—	1907	—	1909	1907	1909	1909
Norsk Meteorologisk Institut (Christiania).	—	1908	1908	1908	1908	1908	—	—
Svensk Meteorologisk Institut (Stockholm).	—	—	—	—	—	—	—	1909
K. Svenska Vetenskaps-Akademie (Stockholm).	—	—	—	—	1908	1908	—	—
Stockholm (H. E. Hamberg) ..	—	—	—	—	—	*	—	—
Upsala, Observatoire Météorologique de l'Université.	—	—	1908	1908	1908	—	—	—
Vassijaure, *K. Svenska Ventensks. Akademie, Stockholm.*	—	—	—	1907	—	—	—	—
db **Russia in Europe:—**								
Observatoire Physique Central Nicolas (St. Petersburg).	—	—	1906	1906	1906	1906	1909†	1908
Finland, Meteorologische Zentralanstalt (Helsingfors).	—	—	1902	1902	1902	1902	—	1907
Kaiserliche Livländische Gemeinnützige u. Ökonomische Sozietät. Dorpat (Jurjef).	—	1905	—	—	—	—	—	—
Dorpat, Meteorologisches Observatorium.	—	—	1908	1908	1908	—	—	—
Dorpat, Station Météorologique de l'École Reale.	—	—	—	—	1906	—	—	—
Kazan, Observatoire Météorologique.	—	—	—	—	1902	—	—	—
Kieff, Observatoire Météorologique.	—	—	—	1907	1907	—	—	—
Moscow (E. Leyst)	—	—	1907	—	—	—	—	—
Moscow, Meteorologisches Observatorium der K. Universität	—	—	—	1907	1907	—	—	—
Nijni-Oltchedaeff, Observatoire Météorologique.	—	—	1909	1909	1909	1909	—	—
Odessa, Observatoire Météorologique et Magnétique de l'Université Impériale.	—	1905	1905	—	1906	1906	—	—
St. Petersburg. Observatoire Météorologique de l'Institut Forestier Impériale.	—	—	—	—	1906	—	—	—
Tiflis, Physical Observatory ..	—	—	—	—	—	—	—	1908
Warsaw, Station Centrale Météorologique du Musée de l'Industrie et de l'Agriculture.	—	—	1903	—	1903	1903	—	—

* Means of temperature in Stockholm for 1756 to 1905 and in Sweden for 1856 to 1907.

GEOGRAPHICAL LIST—*continued.*

NAME OF INSTITUTION, &C.	Climatology—Agricultural and Hygienic. 1710 & 1750.	Rainfall Tables. 1180.	Meteorological Observations—General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values. 1825.	Daily Weather Reports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
EUROPE AND MEDITERRANEAN ISLANDS—*cont.*								
German Empire:—								
Deutsche Seewarte (Hamburg)	—	—	1908	1908	1908	1908	1909†	1908
Prussia, K. Meteorologisches Institut (Berlin).	—	1907	1904	1904	1904	1909	—	1909
Alsace-Lorraine, Meteorologischer Landesdienst (Strassburg).	—	—	1901	1904	1904	1908	—	—
Baden, Central Bureau für Meteorologie und Hydrographie (Carlsruhe).	—	1909	1908	—	1908	1908	—	1909
Bavaria, K. Meteorologische Central Station (Munich).	—	—	1908	1908	1908	1908	1909	—
Hessen, G. Hydrographisches Bureau (Darmstadt).	—	1909	1908	1908	1908	—	—	1909
Saxony, K. Sächs. Landes-Wetterwarte (Dresden).	—	—	1905	1905	1905	1905	1909	1908
Württemberg, K. Statistisches Landesamt und Meteorologische Central Station (Stuttgart).	—	—	1909	1900	1908	1908	—	1909
Aachen, Meteorologisches Observatorium.	—	—	1908	1908	1908	1903	1909	—
Berlin, Wetter Bureau	—	—	—	—	—	—	1909	—
Bremen, Meteorologische Station	—	—	1908	1908	1908	—	—	—
Eberswalde, Meteorologische Station.	—	—	—	—	—	—	—	1903
Emden, Naturforschende Gesellschaft.	—	—	—	—	—	1907	—	—
Frankfurt am Main, Physikalischer Verein.	—	—	—	—	1908	—	—	—
Lindenberg, K. Preussisches, Aeronautisches Observatorium.	—	—	1908†	—	—	—	—	—
Potsdam, K. Preuss. Met. Institut	—	—	1908	1908	1908	—	—	—
Holland; Belgium; Luxemburg:—								
K. Nederlandsch Meteorologisch Institut (de Bilt).	—	1907	1907	1907	1907	1907	1909	1909
Observatoire Royal, Uccle, Brussels.	—	—	1904	1904	1904	1904	1909	—
Mons (A. Bracke)	—	—	—	—	1905	—	—	—
British Islands:—								
Meteorological Office (London)	—	—	—	1909	1909	1909	1909	1909†
British Rainfall (H. R. Mill) ..	—	1908	—	—	—	—	—	—
R. Meteorological Society (London).	—	—	1908	—	1908	1908	—	—
Scottish Meteorological Society (Edinburgh).	—	1907	1907	—	—	1907	—	—
Board of Agriculture and Fisheries, London.	1908	—	—	—	—	—	—	—
General Register Office, Dublin	1909	—	—	—	1909	1909	—	1909
General Register Office, London	1909	—	—	—	1909	1909	—	1909
Registrar General's Office, Edinburgh.	1909	—	—	—	—	1909	—	1909
Royal Observatory, Greenwich	—	—	1907	1907	1907	—	—	—
Royal Society of Edinburgh [Fort William and Ben Nevis].	—	—	—	1897	—	—	—	—
Bath, Medical Officer of Health	1909	—	—	—	—	—	—	—
Blackpool, Public Health Office	1908	—	—	—	—	1908	—	—
Bognor, Medical Officer of Health	1908	—	—	—	—	1908	—	—
Bolton, The Museums and Meteorological Observatory.	—	—	—	—	—	1907	—	1909

GEOGRAPHICAL LIST—*continued.*

NAME OF INSTITUTION, &c.	Climatology—Agricultural and Hygienic. 1710 & 1730.	Rainfall Tables. 1180.	Meteorological Observations—General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values. 1825.	Daily Weather Reports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
d. **EUROPE AND MEDITERRANEAN ISLANDS**—*cont.*								
de. **British Islands**—*cont.*								
Borden Wood, Sussex (E. Lamb)	—	—	—	—	—	1908	—	
Bournemouth (C. Dales)	—	—	—	—	—	1907	—	
Brighton, Medical Officer of Health.	1902	—	—	—	—	—	—	
Burnley, Medical Officer of Health.	1908	—	1908	—	—	—	—	
Buxton, Devonshire Hospital ..	—	—	—	—	—	1908	—	
Canterbury (A. Lander)	—	—	—	—	—	1908	—	
Cardiff, Naturalists' Society ..	—	1907	—	—	—	1907	—	
Cardiff, Waterworks Engineer's Office.	—	1905	—	—	—	—	—	
Chester (J. C. Mitchell)	—	—	—	—	—	1905	—	
Clongowes Wood College ..	—	—	—	—	—	1908	—	
Cockle Park, Morpeth	—	—	—	—	—	1904	—	
Coventry, Medical Officer of Health.	1908	—	—	—	—	1908	—	
Croydon, Natural History and Scientific Society.	—	1908	—	—	1908	—	—	
Devon, North (T. Wainwright)..	—	—	—	—	—	1906	—	
Dorset (*late* H. S. Eaton)	—	1903	—	—	—	—	—	
Eastbourne, Borough Meteorologist.	—	—	—	—	—	1908	—	
East Ham, Public Health Department.	1907	—	—	—	—	1907	—	
Falmouth, R. Cornwall Polytechnic Society.	—	—	—	—	—	1909	—	
Great Central Railway	—	1909	—	—	—	—	—	
Harrogate, Harlow Moor Observatory.	—	—	—	—	—	1907	—	
Hastings, Borough Meteorologist.	—	—	—	—	—	1908	—	
Hertfordshire (J. Hopkinson) ..	—	1906	—	—	—	1906	—	
Hoylake and West Kirby, Urban District Council.	—	—	—	—	—	1908	—	
Isle of Man (A. W. Moore) ..	—	—	—	—	—	1904	—	
Kew National Physical Laboratory.	—	—	—	—	—	1908	—	
Liverpool Observatory, Bidston.	—	—	—	—	1908	—	—	
London, Royal Botanic Society	—	—	—	—	1906	—	—	
Lowestoft, Medical Officer of Health.	1908	—	—	—	—	1908	—	
Manchester, Godlee Observatory.	—	—	—	—	1908	—	—	
Manchester, Public Health Office	1904	—	—	—	1904	—	—	
Margate, Borough Meteorologist	—	—	—	—	—	1908	—	
[Netley.] *Army Medical Department, London.*	—	—	—	—	—	1906	—	
Northampton, Natural History Society.	—	1908	—	—	—	—	—	1908
Norwich (A. W. Preston) ..	—	—	—	—	—	1908	—	—
Nottingham (A. Brown and P. Boobbyer).	—	1909	1909	—	—	—	—	—
Nottingham, Rural District Council of Basford.	1903	—	—	—	—	1903	—	—
Paisley, Coats Observatory ..	—	—	—	—	—	1905	—	—
Perth, Natural History Museum	—	—	—	—	—	1908	—	—
Portsmouth, Medical Officer of Health.	1908	—	1908	—	—	—	—	—
Rousdon Observatory	—	—	—	—	—	1903	—	—
Rugby School Natural History Society.	—	—	—	—	—	1906	—	—
Scarborough, Borough Meteorologist.	—	—	—	—	—	1906	—	—
Seaham Harbour, Medical Officer of Health.	1907	—	—	—	—	1907	—	—
Sevenoaks (W. W. Wagstaffe) ..	—	—	—	—	—	1905	—	—
Shropshire (W. M. De La Touche)	—	1907	—	—	—	—	—	—
Southampton, Medical Officer of Health	1906	—	—	—	—	1906	—	—

GEOGRAPHICAL LIST—*continued.*

NAME OF INSTITUTION, &c.	Climatology—Agricultural and Hygienic. 1710 & 1730.	Rainfall Tables. 1180.	Meteorological Observations—General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values. 1825.	Daily Weather Reports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
EUROPE AND MEDITERRANEAN ISLANDS—*cont.*								
British Islands—*cont.*								
Southport, Fernley Observatory	—	—	1908	1908	1909	1908	—	—
Stonyhurst College Observatory	—	—	—	—	—	1909	—	—
Throcking (C. W. Harvey) ..	—	—	—	—	—	1904	—	—
Totland Bay, Isle of Wight (J Dover).	—	—	—	—	—	1909	—	—
Truro, Cornwall County Council, Sanitary Committee.	1909	—	—	—	—	1908	—	1909
Truro (G. Penrose)	—	—	—	—	—	1900	—	—
Waterford (C. E. Perceval Bolton).	—	—	—	—	—	—	—	1906
Whitchurch (E. E. Glyde) ..	—	—	1909	—	—	—	—	—
Worksop (H. Mellish)	—	—	—	—	—	1908	—	—
York, Yorkshire Philosophical Society.	—	—	—	—	—	1908	—	—
France and Corsica:—								
Bureau Central Météorologique de France (Paris).	—	1906	1906	1906	1906	1906	1909	1909
Avignon, Commission Météorologique du Département de Vaucluse.	—	—	1903	—	—	1903	—	—
Beaulieu, Sèvres et Vacquey (G. Eiffel).	—	—	1903	—	1905	—	—	—
Bordeaux, Commission Météorologique de la Gironde.	—	1908	—	—	1908	—	—	—
Chevreuse, Observatoire	—	—	—	—	1907	—	—	—
Lyons, Commission Départementale de Météorologie du Rhône.	—	1908	1908	—	—	—	—	—
Marseilles, Commission de Météorologie du Département des Bouches-du-Rhone.	—	—	1908	—	1908	—	—	—
Paris, Observatoire Municipal (Observatoire de Montsouris).	—	—	—	—	1907	—	—	—
Paris, Service Hydrométrique du Bassin de la Seine.	—	1907	—	—	—	—	—	—
Perpignan, Commission Météorologique.	—	—	1907	—	1907	1907	—	—
Puy-de-Dôme, Observatoire ..	—	—	—	—	1905	—	—	—
Iberian Peninsula (including Pyrenees): Spain (with Balearic Islands); Portugal:—								
Instituto Central Meteorológico (Madrid).	—	—	—	—	—	1908	1909	—
Observatorio Do Infante D. Luiz (Lisbon).	—	—	—	—	1906	1906	1909	—
Observatorio, Madrid	—	—	—	—	1907	1900	—	—
Coimbra, Observatorio Meteorologico e Magnetico da Universidade.	—	—	1908	1908	1908	—	—	—
Gibraltar. *Army Medical Dep., London.*	—	—	—	—	—	1906	—	—
Granada, Observatorio Meteorológico de Cartuja.	—	—	1908	1908	1909	—	—	—
Llinas, Observatorio Belloch ..	—	—	1904	—	—	—	—	—
Madrid, Chamartin de la Rosa, Observatorio Meteorológico.	—	—	—	—	1906	—	—	—
Mahon (Minorca). *Bureau Central Met., Paris.*	—	—	—	—	—	1906	—	—
Oña, Observatorio	—	—	—	—	1909	—	—	—
Oporto, Observatorio Meteorologico da Princeza D. Amelia.	—	—	—	—	—	1909	—	—
San Fernando, Instituto y Observatorio de Marina.	—	—	1908	1908	1908	—	—	—

GEOGRAPHICAL LIST—*continued.*

NAME OF INSTITUTION, &c.	Climatology—Agricultural and Hygienic. 1710 & 1730.	Rainfall Tables. 1180.	Meteorological Observations—General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values 1825.	Daily Weather Re- 18
d.* EUROPE AND MEDITERRANEAN ISLANDS—*cont.							
***dh.* Italy: Sicily and Sardinia:—**							
Ufficio Centrale Meteorologico e Geodinamico Italiano (Rome).	1909	—	1906	—	—	1906	190
Bologna, Osservatorio della R. Università.	—	—	—	—	1908	—	—
Catania, R. Osservatorio	—	—	—	—	—	1908	—
Florence, R. Museo di Fisica e Storia Naturale.	—	—	—	—	1908	—	—
Florence, Osservatorio Ximeniano	—	—	—	—	—	1907	—
Messina, Osservatorio	—	—	—	—	1907	—	—
Milan, R. Osservatorio Astronomico di Brera.	—	—	—	—	1907	—	—
Moncalieri, Osservatorio del Real Collegio Carlo Alberto.	—	—	—	—	1909	—	—
Naples, R. Osservatorio di Capodimonte.	—	—	—	—	1906	1906	—
Riposto, Osservatorio Meteorologico del R. Instituto Nautico.	—	—	—	—	1909	—	—
Rome, Specola Vaticana	—	—	—	—	1905	—	—
Turin, Osservatorio della R. Università.	—	—	—	—	1908	—	—
Venice, Osservatorio Meteorologico del Seminario Patriarcale.	—	—	—	—	1906	—	—
Venice, Ufficio Idrografico ..	—	—	—	1909	1908	—	—
***di.* Switzerland:—**							
Schweizerische Meteorologische Central Anstalt (Zürich).	—	1907	1908†	1908	1908	1908	190
Berne, Abteilung für Landeshydrographie.	—	1908	1908	1904	1908	—	—
Davos Traffic Association ..	—	—	—	—	1909	—	—
Genève et le Grand St. Bernard (R. Gautier).	—	—	—	—	1908	—	—
Lausanne, Institut Agricole ..	—	—	—	—	1908	—	—
St. Moritz (R. Gautier et H. Duaime).	—	—	—	—	1908	—	—
***dk.* Austria-Hungary, with Bosnia and Herzegovina:—**							
K. K. Central Anstalt für Meteorologie und Erdmagnetismus (Vienna).	—	—	1907	1907	1908†	1907	190
K. K. Hydrographischer Dienst in Österreich (Vienna).	—	1906	—	—	1906	—	—
Hydrographisches Amt der K. K. Kriegs-Marine (Pola).	—	—	1908	1908	1908	1906	—
K. Ung. Reichs-Anstalt für Meteor. und Erdmagn. (Budapest).	—	1906	1906	1906	1909	1906	190
Bosnisch-Hercegovinische Landesregierung (Sarajevo).	—	—	1907	1907	1907	1907	—
Agram, Meteorologisches Observatorium.	—	1906	1906	1906	1906	—	—
Brünn, Meteorologische Commission des naturforschenden Vereines.	—	—	1905	—	—	1905	—

Geographical List—*continued.*

Name of Institution, &c.	Climatology—Agricultural and Hygienic. 1710 & 1730.	Rainfall Tables. 1180.	Meteorological Observations—General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values. 1825.	Daily Weather Reports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
EUROPE AND MEDITERRANEAN ISLANDS—*cont.*								
Austria-Hungary, with Bosnia and Herzegovina—*cont.*								
Cracow, C. K. Akademii Umiejetnosci u. Krakowie.	—	—	—	—	1902	—	—	—
Cracow, K. K. Sternwarte ..	—	—	—	—	1909	—	—	—
Cracow, Obserwatoryum ..	—	—	—	—	—	1908	—	—
Fiume, K. K. Marine-Akademie	—	—	—	—	1908	—	—	—
Innsbruck, Meteorologisches Observatorium.	—	—	1906	1906	1906	—	—	—
Klagenfurt (F. Jäger)	—	—	—	—	1907	1907	—	—
Kremsmünster, Sternwarte ..	—	—	1906	1906	—	—	—	—
Prague, K. K. Sternwarte ..	—	—	—	—	1908	—	—	—
Trieste, [I.R.] Osservatorio Astronomico-Meteorologico.	—	—	1905	1905	1905	1905	—	—
Trieste, I.R. Osservatorio Marittimo.	—	—	—	—	—	—	1909	—
Vienna, K. K Sternwarte ..	—	—	—	—	1903	—	—	—
Balkan Peninsula:—								
Observatorul Astronomic si Meteorologic (Bucharest).	1909	1909	1902	1902	1902	1902	1909	1909
Observatoire National (Athens)	—	—	—	—	—	1903	—	—
Belgrade, Observatoire Central	—	—	—	1903	—	—	—	1903
Monastir and Cavalla. *Bureau Central Mét., Paris.*	—	1905	—	—	—	1906	—	—
Roumania (S.O. Hepites)	—	1903	—	—	—	—	—	—
Salonika, Gymnase Bulgare ..	—	—	—	—	—	1908	—	—
Salonika and Scutari. *K. K. Central-Anstalt für Meteorologie, Vienna.*	—	—	—	—	—	1907	—	—
Salonika. *Observatoire Physique Central Nicolas, St. Petersburg.*	—	—	—	—	—	1906	—	—
Sofia, Institut Météorologique Central.	—	—	1908	1908	1908	1908	—	—
Sofia, Station Centrale Météorologique de Bulgarie.	—	1909	—	—	—	—	—	1909
Thera. (F. Frhv. Hiller von Gaertringen.)	—	—	1902	1902	1902	1902	—	—
Mediterranean and Islands:—								
Cyprus Public Works Department (Nicosia).	—	1909	—	—	—	1907	—	—
Malta and Cyprus. *Army Medical Dep., London.*	—	—	—	—	—	1906	—	—
Malta. *Bureau Central Mét., Paris*	—	—	—	—	—	1902	—	—
English Channel, including Channel Islands:—								
Guernsey (A. Collenette).. ..	—	1909	—	—	—	1909	—	—
Jersey, Observatoire St. Louis ..	—	—	1909	1909	1909	—	—	—
ASIA AND MALAY ARCHIPELAGO.								
Asiatic Russia:—								
Observatoire Physique Central Nicolas (St. Petersburg).	—	—	1906	1905	1906	1906	—	—

GEOGRAPHICAL LIST—*continued.*

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e. **ASIA AND MALAY ARCHIPELAGO**—*cont.*							
eaa. **West Siberia:**—							
Tobolsk, Tomsk. *Observatoire Physique Central Nicolas, St. Petersburg.*	—	—	—	—	1906	1906	—
eab. **East Siberia:**—							
Irkutsk, Observatoire Magnétique et Météorologique.	—	—	1905	1905	1905	1905	—
Observatoire Physique Central Nicolas, St. Petersburg.	—	—	—	—	1906	1906	—
eac. **Central Asiatic Russia:**—							
Observatoire Physique Central Nicolas, St. Petersburg.	—	—	—	—	1906	1906	—
eb. **China and Dependencies: Tibet, Corea:**—							
Hong-Kong, Observatory ..	—	—	1908	1908	1909	—	—
Chimulpo, Meteorological Observatory.	—	—	1908	—	1908	—	—
Chimulpo, Peking, Urgar. *Observatoire Physique Central Nicolas, St. Petersburg.*	—	—	—	—	—	1906	—
Deutsche Seewarte, Hamburg ..	—	—	—	1907	1901	1907	—
Hong-Kong and Wei-hai-wei. *Army Medical Dep., London.*	—	—	—	—	—	1906	—
Kashgar, &c. *Meteorological Office, India (Simla).*	—	—	—	—	—	1908	—
Kharbin (Manchuria), *Observatoire Physique Central Nicolas, St. Petersburg.*	—	—	1906	1906	1906	1906	—
Ou-tschang. *K. K. Central-Anstalt für Meteorologie, Vienna.*	—	—	—	—	—	1906	—
Peking, Inspectorate General of Customs.	1904	—	—	—	—	—	—
Tokio, Central Meteorological Observatory.	—	—	—	—	1906	—	—
Tchang-Sin-Tien, Tien-Tsin, Yunnan-Sen, &c. *Bureau Central Mét., Paris.*	—	1906	—	—	—	1906	—
Weihawei, Medical Officer ..	—	—	—	—	—	1906	—
Zikawei, Observatoire Magnétique et Météorologique.	—	—	1906	1906	1906	1906	1908
ec. **Japanese Islands, Formosa:**—							
Central Meteorological Observatory (Tokio).	—	—	1907	1907	1907	1907	1909
Mizusawa, International Latitude Observatory.	—	—	1908	—	1908	1908	—
Tsukubasan, Observatorium ..	—	—	1903	1903	1903	—	—
ed. **French Indo-China: Tonquin, Annam, &c.:**—							
Bureau Central Mét., Paris ..	—	1905	1906	—	1906	1906	—
ee. **Siam:**—							
Battambang, Pnom-Penh, Vien-Tiane (Laos), &c. *Bureau Central Mét., Paris.*	—	—	—	—	—	1906	—

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ASIA AND MALAY ARCHIPELAGO—*cont.*								
British India: Himalaya, Burmah, Ceylon:—								
Meteorological Office, India, (Simla).	—	1908	1909	—	1909	1909	1909	1908
Agricultural Department, Calcutta.	—	1908	—	—	—	—	—	—
Meteorological Office, Bengal, Calcutta.	—	1907	1907	—	—	1908	1909	1908
Observatory, Colombo	—	—	1908	—	—	1909	—	—
Allahabad, Meteorological Office	—	1907	—	—	—	1907	—	—
Bangalore, Mysore Government Meteorological Department.	—	1908	1908	—	1908	1908	—	—
Bombay, Government Observatory.	—	—	1905	—	1905	—	—	—
Ceylon, Royal Botanic Gardens	—	1903	—	—	—	—	—	—
Kodaikánal, Observatory ..	—	—	—	—	—	1908	—	—
Meteorological Reporter to Government, Punjab.	—	—	—	—	—	1909	—	1909
Karikal, Pondichery, Yanaon (Madras Pres.), &c. *Bureau Central Mét., Paris.*	—	—	—	—	—	1906	—	—
Malay Peninsula and Archipelago, Philippines, &c.:—								
Royal Magnetical and Meteorological Observatory (Batavia).	—	1907	1906	1906	—	1906	—	—
Philippine Weather Bureau, Manila Central Observatory.	—	—	1907	1907	1908	—	—	1908
Principal Civil Medical Officer, Straits Settlements (Singapore).	—	1904	1907	—	1907	1907	—	—
British North Borneo (British N. Borneo Herald).	—	—	—	—	1907	—	—	—
Buitenzorg, Institut Botanique de l'Etat.	—	—	—	—	1907	—	—	—
Penang, Singapore. *Meteorological Office, India (Simla).*	—	—	—	—	—	1908	—	—
Singapore. *Army Medical Dep., London.*	—	—	—	—	—	1906	—	—
Taiping, State Surgeon's Office..	—	—	—	—	—	1908	—	—
Persia, Afghanistan, Baluchistan, Pamirs:—								
Bushire, Ispahan, Jask, Kabul, Quetta, &c. *Meteorological Office, India (Simla).*	—	—	—	—	—	1908	—	—
Bushire. *Bureau Central Mét., Paris.*	—	—	—	—	—	1905	—	—
Enzeli, Khousseinabad (Seistan). *Observatoire Physique Central Nicolas, St. Petersburg.*	—	—	—	—	—	1906	—	—
Asiatic Turkey, Arabia, Syria:—								
Aden, Baghdad, Bahrein, Busrah, Muscat, Beyrout. *Meteorological Office, India (Simla).*	—	—	—	—	—	1908	—	—
Babylon. *Deutsche Seewarte, Hamburg.*	—	—	—	—	—	1907	—	—
Beyrout, Jerusalem, &c. *K. K. Central-Anstalt für Meteorologie, Vienna.*	—	—	1907	—	1907	1907	—	—

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e.* ASIA AND MALAY ARCHIPELAGO—*cont.								
ei.* Asiatic Turkey, Arabia, Syria—*cont.								
Hebron. *Scottish Met. Soc., Edinburgh.*	—	—	—	—	—	1907	—	
Le Krey (Syria), Smyrna, and other stations. *Bureau Central Mét., Paris.*	—	1905	—	—	1906	1906	—	
Scutari. *Army Medical Dep., London.*	—	—	—	—	—	1906	—	
Sinope, Bouiouk-Dere. *Observatoire Physique Central Nicolas, St. Petersburg.*	—	—	—	—	—	1906	—	
***f.* AFRICA AND MADAGASCAR.**								
***fa.* Mediterranean States: Morocco, Algiers, Tunis, Tripoli:—**								
Service Météorologique du Gouvernement Général de l'Algérie.	—	—	—	—	—	—	1909	
Algeria and Tunis, Benghazi (Tripoli), Tangier, Mogador. *Bureau Central Mét., Paris.*	—	—	1906	—	1906	1906	—	
Casablanca, Mogador, Saffi. *Deutsche Seewarte, Hamburg*	—	—	—	—	—	1907	—	
Tripoli. *Ufficio Centrale Met. e Geodinam., Ital., Rome.*	—	—	—	—	—	1896	—	
***fb.* North-east Africa: Egypt, Nile Valley to 5° N., Abyssinia:—**								
Survey Department, Cairo ..	—	1905	1907	1907	1907	1907	1909	1
Department of Public Health, Cairo.	1909	—	—	—	1909	—	—	1
Egyptian Sudan. *Meteorological Office, London.*	—	—	—	—	—	1902	—	
Adis-Abéba (Abyssinia). *Observatoire Physique Central Nicolas, St. Petersburg.*	—	—	—	—	—	1906	—	
Khartoum. *Army Medical Dep., London.*	—	—	—	—	—	1904	—	
Ismailia, Port Said, Suez, Harar (Abyssinia). *Bureau Central Mét., Paris.*	—	—	—	—	1906	1906	—	
***fc.* Sahara and the Central Sudan:—**								
Fort Lamy (Tchad), &c. *Bureau Central Mét., Paris.*	—	—	—	—	—	1906	—	
***fd.* West Africa, including French Sudan, from Morocco to the Congo:—**								
Accra, Observatory	—	—	—	—	—	1906	—	
Afrique Occidentale Française ..	—	—	—	—	—	1908	—	
Gambia, Medical Officer	—	—	—	—	1909	—	—	
Lagos, Survey Department ..	1909	—	—	—	..	1908	—	
Sierra Leone Observatory ..	—	1903	—	—	—	—	—	
Zungeru (Northern Nigeria), Principal Medical Officer.	1908	—	1908	—	1908	1908	—	

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f.	**AFRICA AND MADAGASCAR** —*cont.*								
fd.	**West Africa, including French Sudan, from Morocco to the Congo**—*cont.*								
	Sierra Leone, Accra, Cape Coast, Kumasi. *Army Medical Dep., London.*	—	—	—	—	—	1906	—	—
	Dahomey, French Guinea, **French** Sudan, Ivory Coast, **Senegal.** *Bureau Central Met., Paris.*	—	—	—	—	1906	1906	—	—
	Mamfe, Tintu (Cameroon). *Deutsche Seewarte, Hamburg.*	—	—	—	—	—	1907	—	—
fe.	**Congo State and Angola:—**								
	Akka (*Meteorological Office, London*).	—	—	—	—	—	1902	—	—
	Lambaréné, Libreville and other **stations.** *Bureau Central Met., Paris.*	—	—	—	—	1906	1906	—	—
ff.	**East Africa; British (with Uganda); German; Portuguese (north of the Zambesi); British Central Africa; Lake Region.**								
	British East Africa ..	—	—	—	—	—	1902	—	—
	British Central Africa	—	—	—	—	—	1902	—	—
	Rhodesia	—	—	—	—	—	1902	—	—
	Uganda	—	—	—	—	—	1902	—	—
	(*Meteorological Office, London.*)								
	German East Africa. *Deutsche Seewarte, Hamburg.*	—	—	—	1907	1907	1907	—	—
	Boroma and Zumba. *Haynald Observatorium, Kalocsa.*	—	—	1897	1897	1897	—	—	—
	Mombasa. *Army Medical Dep., London.*	—	—	—	—	—	1903	—	—
	British East Africa Agricultural Department (Nairobi).	—	—	—	—	—	1905	—	1905
	Rhodesia. *Government Statist* ..	—	—	—	—	—	1907	—	—
	Uganda Protectorate, Scientific and Forestry Department (Entebbe).	—	—	—	—	1905	1908	—	—
	Zanzibar. *Meteorological Office, India (Simla).*	—	—	—	—	—	1908	—	—
	Zomba, Forestry and Botanical Department.	—	1903	—	—	1909	—	—	—
fg.	**South Africa—South of Angola and the Zambesi:—**								
	Meteorological Commission (Cape Town).	—	1908	1908	1902	—	1908	—	—
	Transvaal Meteorological Department (Johannesburg).	—	1909	1908	1908	1908	—	1909	1909
	Beira, Observatorio Meteorologico.	—	—	—	—	1909	—	—	—
	Bulawayo (E. Goetz)	—	—	—	—	—	1904	—	—
	Durban, Natal Observatory ..	—	1902	1908	—	1908	1908	—	—
	Fort Napier (Natal), Pretoria. *Army Medical Dep., London.*	—	—	—	—	—	1906	—	—
	German S.W. Africa (E. Ottweiler).	—	1905	—	—	—	—	—	—
	Loanda, Observatorio	—	—	—	—	—	1908	—	—
	Southern Rhodesia, &c. *Meteorological Office, London.*	—	—	—	—	—	1902	—	—

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f. **AFRICA AND MADAGASCAR** —*cont.*							
fh. **Madagascar and Comoro Group:—**							
Tananarive, Observatoire ..	—	—	1908	1908	1908	1908	—
Bureau Central Mét., Paris ..	—	1906	—	—	1906	1906	—
fi. **Red Sea and Islands:—**							
K. Akademie der Wissenschaften, Vienna.	—	—	—	[1903]	[1903]	—	—
Perim. *Meteorological Office, India (Simla).*	—	—	—	—	—	1908	—
g. **NORTH AMERICA.**							
gb. **Canada as a whole:—**							
Meteorological Service, Dominion of Canada (Toronto).	—	—	—	—	—	—	1909
Department of Marine and Fisheries (Ottawa).	—	—	1906	1906	1906	1906	—
Toronto Observatory	—	—	—	—	—	1907	—
U.S. Weather Bureau, Washington	—	—	—	—	—	1908	—
gc. **Canadian Dominion West.**							
Alberta, Official Handbook ..	—	—	—	—	—	1906	—
Edmonton, Department of Agriculture.	—	—	—	—	—	1906	—
Regina, Department of Agriculture.	—	—	—	—	—	1905	—
gd. **Canadian Dominion East: Newfoundland, Labrador:—**							
Toronto, Bureau of Industries ..	—	—	1904	—	—	—	—
Hebron, Nain, *Deutsche Seewarte, Hamburg.*	—	—	—	—	—	1907	—
St. Pierre and Miquelon, *Bureau Central Mét., Paris.*	—	1905	—	—	—	1902	—
St. Croix, Dansk Meteorologisk Institut, Copenhagen.	—	—	—	—	—	1907	—
gf. **United States as a whole:—**							
U.S. Weather Bureau, Department of Agriculture, Washington.	—	—	1908	1908	1908	1908	1909
gg. **North-Eastern United States, East of Mississippi:—**							
Cambridge (Mass.), Astronomical Observatory of Harvard College.	—	—	—	—	1905	—	—
New York, Meteorological Observatory.	—	—	—	1909	—	—	—
Washington, United States Naval Observatory.	—	—	—	—	1902	—	—
gl. **Western United States, West of Mississippi:—**							
Colorado Springs, Colorado College, Observatory.	—	—	—	—	1907	1907	—

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9. NORTH AMERICA—*cont.*								
Mexico:—								
Dirección General de Telégrafos Federales (Mexico).	—	—	—	—	—	—	1903	—
Observatorio Meteorológico Central (Mexico).	—	—	1903	1903	1903	—	—	1903
Guadalajara, Observatorio del Seminario Conciliar.	—	—	—	—	1908	—	—	—
Leon, Observatorio Meteorológico.	—	—	—	—	1909	—	—	1909
Morelia, Observatorio Meteorológico.	—	—	1909	—	1909	1909	—	—
Oaxaca (A. M. Dominguez) ..	—	1903	—	—	—	—	—	—
Oaxaca, Observatorio Meteorológico.	—	—	—	—	1907	—	—	1907
Puebla, Boletin de Estadistica..	1908	—	—	—	1908	—	—	—
Saltillo, Observatorio Meteorológico del Colegio de San Juan Nepomucino.	—	—	—	—	1905	—	—	—
Tacubaya, Observatorio Astrónomico Nacional.	—	—	1897	—	1897	1897	—	—
U.S. Weather Bureau, Washington.	—	—	—	—	—	1908	—	—
Zacatecas, Observatorio	—	—	1908	—	1908	1908	—	—
CENTRAL AND SOUTH AMERICA AND WEST INDIES.								
Central America, &c.:—								
Belize, Public Hospital	—	—	—	—	1905	—	—	—
Costa Rica, *U.S. Weather Bureau, Washington.*	—	—	—	1908	—	—	—	—
San Salvador, Observatorio Meteorologico y Astronomico.	—	—	—	—	—	1902	—	—
Tegucigalpa, Laboratorio Central	—	—	—	—	1905	—	—	—
West Indian Islands, Caribbean Sea, Gulf of Mexico:—								
Antigua, Government Laboratory.	—	1908	—	—	1907	1908	—	—
Bahamas (Colonial Reports) ..	—	—	—	—	1902	1905	—	—
Barbados, St. Lucia, Jamaica, Bermuda. *Army Medical Dep., London.*	—	—	—	—	—	1906	—	—
Dominica, Botanic Station ..	—	1907	—	—	—	—	—	—
Grenada, Carriacou Observatory	—	—	—	—	1908	—	—	—
Grenada, Richmond Hill Observatory.	—	1908	—	—	1909	—	—	—
Guadeloupe, Haiti, Martinique. *Bureau Central Met., Paris.*	—	—	—	—	1906	1906	—	—
Havana, Observatorio del Colegio de Belen.	—	—	—	—	1908	—	—	—
Havana, Secretaria de Agricultura, &c.	1909	—	1909	—	1909	1909	—	—
Jamaica, Government Laboratory, Kingston.	—	1909	1909	—	—	1909	—	1909
Port-au-Prince, Haiti. *K. K. Central-Anstalt für Meteorologie, Vienna.*	—	—	1907	—	1907	1907	—	—
St. Lucia, Agricultural Superintendent.	—	1909	—	—	—	—	—	—
St. Lucia Botanic Gardens ..	—	1908	—	—	—	1908	—	—
St. Lucia, Harbour Master ..	—	—	—	—	1909	—	—	—
St. Vincent, Botanic Gardens ..	—	1907	1903	—	—	—	—	—
U.S. Weather Bureau. Washington.	—	—	—	—	—	1908	—	—

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h. CENTRAL AND SOUTH AMERICA AND WEST INDIES—*cont.*								
hd. Guiana—British, Dutch, and French; Venezuela; Trinidad:—								
Cayenne. *Bureau Central Met., Paris.*	—	—	—	—	1908	1906	—	
Georgetown, Demerara. Botanic Gardens.	—	—	—	—	1909	1908	—	
Paramaribo. *K. Nederlandsch Meteorologisch Instituut, de Bilt.*	—	—	—	—	1904	—	—	
Trinidad, Royal Botanic Gardens	—	1908	1907	—	—	1908	—	
hf. Peru:—								
Astronomical Observatory of Harvard College, Cambridge (Mass.).	—	—	—	1895	1895	—	—	
Piura. *Deutsche Seewarte. Hamburg.*	—	—	—	—	—	1906	—	
hg. Bolivia:—								
Mulidi. *Bureau Central Met., Paris.*	—	—	—	—	—	1903	—	
hh. Brazil:—								
Ministerio de Marinha, Directoria de Meteorologia, Rio Janeiro.	—	—	1904	1904	1906	—	—	
Cuyabà, Observatorio Meteorologico "D. Bosco."	—	—	—	—	1908	—	—	
Para Prata. *K. K. Central-Anstalt für Meteorologie, Vienna.*	—	—	—	—	1906	—	—	
Rio Janeiro, Observatorio ..	—	—	1907	—	1907	1908	—	
Sao Paulo, Secretaria da Agricultura, &c.	—	—	—	—	—	1905	—	
Descalvados. *Deutsche Seewarte. Hamburg.*	—	—	—	1906	—	1906	--	
hl. Argentina, Uruguay, and Paraguay:—								
Oficina Meteorológica Argentina (Buenos Aires).	—	—	—	—	—	—	1909	
Dirección General del Servicio Meteorológico Nacional, Monte Video.	—	1905	—	—	—	1905	—	
Direccion General de Estadistica del Uruguay, Monte Video.	1906	—	—	—	—	1906	—	
Fray Bentos. *Deutsche Seewarte, Hamburg.*	—	—	—	—	—	1893	—	
Monte Video, Observatorio National Fisico-Climatologico.	—	—	—	1908	1908	—	—	
Villa Colón, Observatorio Meteorológico.	—	—	—	1902	1902	1906	--	

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ND SOUTH AMER-/EST INDIES—*cont.*								
Meteorológico de la del Territorio (Valparaiso.)	—	—	—	—	1907	1907	—	—
enas, Observatorio ógico del Colegio "S. José."	—	1902	1907	1907	1909	1907	—	—
Observatorio Astro-	—	—	1906	—	—	1906	—	—
TRALASIA.								
servatory	—	—	—	—	—	—	1909	—
:—								
rernment Gazette) ..	—	—	—	—	—	1908	—	—
chipelago :—								
utsche Seewarte, Ham-	—	—	—	—	—	1906	—	—
eather Bureau, Mel-	—	1908	—	—	—	—	1909	—
:—								
Government Statis-fice.	1905	—	—	—	—	1905	—	—
Weather Bureau ..	—	—	—	—	—	1907	—	—
Wales :—								
epartment of Public on.	—	1902	—	—	1902	1902	—	—
ohn Tebbutt)	—	—	—	—	—	1903	—	—
alia :—								
bservatory	—	1905	1905	—	1905	1905	—	—
lia :—								
rvatory	—	1908	1906	—	1906	1906	—	1906
rnment Statistician's	—	1907	1907	—	—	1907	—	—
d :—								
Meteorological Office	—	1908	1908	—	1908	1908	1905	—
Government Obser-	—	—	—	—	1904	—	—	—

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i.* AUSTRALASIA—*cont.								
***il.* New Caledonia, New Hebrides, and Loyalty Islands:—**								
Noumea, Paita (N. Cal.), Port Vila (New Hebrides). *Bureau Central Mét., Paris.*	—	1906	—	—	—	1906	—	—
***k.* ARCTIC.**								
***ka.* Arctic Ocean:—**								
Ziegler Polar Expedition, 1903-5	—	—	—	—	1905	—	—	—
***kb.* Greenland:—**								
Dansk Meteorologisk Institut (Copenhagen).	—	—	—	—	1907	1907	—	—
***kd.* Islands north of Europe and Asia:—**								
Norwegian North Polar Expedition [H. Mohn].	—	—	1896	1896	1896	—	—	—
Spitzbergen (J. Westman) ..	—	—	—	1900	—	—	—	—
***l.* ATLANTIC.**								
***lb.* Azores, Canaries, Madeira, Cape Verde:—**								
Service Météorologique des Açores, Ponta Delgada.	—	—	1908	1908	—	1908	—	—
Las Palmas. *Instituto Central Meteorológico, Madrid.*	—	—	—	—	—	1908	—	—
Teneriffe, Las Palmas. *Observatorio Do Infante D. Luiz, Lisbon.*	—	—	—	—	—	1905	—	—
Teneriffe, Las Palmas. *Bureau Central Mét., Paris.*	—	—	—	—	—	1906	—	—
Teneriffe, La Paz Botanica. *Deutsche Seewarte, Hamburg.*	—	—	—	—	—	1907	—	—
***m.* INDIAN OCEAN.**								
***ma.* Ocean and Islands north of Equator:—**								
Amini Divi, Minicoy. *Meteorological Office, India (Simla).*	—	—	—	—	—	1908	—	—
***mb.* Ocean and Islands south of Equator:—**								
Christmas Island. *Scottish Met. Soc., Edinburgh.*	—	—	—	—	—	1907	—	—
Christmas Island. Straits Settlements Gazette.	—	—	—	—	1908	—	—	—
Mauritius, Royal Alfred Observatory.	—	—	1908	1905	1906	—	—	—
Mauritius. *Army Medical Dep., London.*	—	—	—	—	—	1903	—	—
Mauritius, Seychelles, Diego Garcia. *Meteorological Office, India (Simla).*	—	—	—	—	—	1908	—	—
Réunion. *Bureau Central Mét., Paris.*	—	1906	—	—	—	1906	—	—

GEOGRAPHICAL LIST—*continued.*

NAME OF INSTITUTION, &c.	Climatology—Agricultural and Hygienic. 1710 & 1730.	Rainfall Tables. 1180.	Meteorological Observations—General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values 1825.	Daily Weather Reports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
n. **PACIFIC.**								
Pacific Islands North of Equator:—								
Honolulu (R. C. Lydecker) ..	—	—	—	—	1903	—	—	—
Honolulu. *U.S. Weather Bureau, Washington.*	—	—	—	—	1908	—	—	—
Caroline, Gilbert and Marshall Islands. *Deutsche Seewarte, Hamburg.*	—	—	—	1906	1906	1907	—	—
Pacific Islands South of Equator:—								
Samoa Observatorium	—	—	1906	1906	—	1906	—	—
Samoa and Cook Islands. *Deutsche Seewarte, Hamburg.*	—	—	—	—	1906	1907	—	—
Suva, Department of Agriculture	—	—	—	—	—	1908	—	—
Suva, Fiji (J. D. W. Vaughan) ..	—	—	—	—	1905	—	—	—
Tahiti, Rikitea (Mangareva). *Bureau Central Mét., Paris.*	—	—	—	—	1904	1906	—	—
o. **ANTARCTIC.**								
Georgia, and Islands S. of S. Atlantic:—								
Schwedische Südpolar Expedition (Snow Hill).	—	—	1903	1903	—	—	—	—
Islands South of Indian Ocean:—								
Deutsche Südpolar Expedition, Winterstation des "Gauss."	—	—	1903	1903	1903	—	—	—
Islands to Southward and South-East of New Zealand:—								
National Antarctic Expedition, 1901–1904.	—	—	1904	1904	1904	—	—	—

ST OF CURRENT METEOROLOGICAL PERIODICALS AND JOURNALS CONTAINING OCCASIONAL ARTICLES ON METEOROLOGICAL SUBJECTS RECEIVED FOR THE OFFICE LIBRARY.

ales de l'Observatoire Municipal, Paris.
ales du Bureau Central Météorologique de France.
nalen der Hydrographie und maritimen Meteorologie.
li dell' Ufficio Centrale Meteorologico e Geodinamico Italiano.
laire de la Société Météorologique de France.
naire Météorologique de l'Observatoire Royal de Belgique.
lem Archiv der Deutschen Seewarte.
äge zur Physik der freien Atmosphäre.
n mensual del Observatorio meteorológico central de Mexico
tino bimensuale della Societa Meteorologica Italiana.

†Bulletin de l'Institut Aerodynamique de Koutchino.
†Ciel et Terre.
Comptes rendus hebdomadaire des séances de l'Académie des Sciences, Paris.
†Das Wetter.
Geographical Journal.
Globe (Le), Journal Géographique.
Himmel und Erde.
Indian Meteorological Memoirs.
Jahrbuch der Astronomie und Geophysik (H. J. Klein).
Journal of Balneology and Climatology.
Journal of the Franklin Institute.
Journal of the Meteorological Society of Japan.
Journal of the Royal United Service Institution.
Journal of the Scottish Meteorological Society.
Journal of the Royal Society of Arts.
London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science.
Memoirs and Proceedings of the Manchester Literary and Philosophical Society.
Memorias de Sociedad Cientifica "Antonio Alzate," Mexico.
Meteorologische Zeitschrift.
Mitteilungen aus dem Gebiete des Seewesens, Pola.
Monthly Meteorological Bulletin of the Nicolas Central Physical Observatory.
Monthly Notices of the Royal Astronomical Society.
Monthly Weather Review of the U.S. Weather Bureau.
Nature.
Nature (La).
Nautical Magazine.
Oversigt over det Kongelige danske Videnskabernes Selskab Forhandlinger.
Petermann's (Dr. A.) Mitteilungen aus Justus Perthes' Geographischer Anstalt.
Proceedings of the American Philosophical Society.
Proceedings of the Cambridge Philosophical Society.
Proceedings of the Royal Institution.
Proceedings of the Royal Irish Academy.
Proceedings of the Royal Society of London.
Quarterly Journal of the Royal Meteorological Society.
Scientific Proceedings of the Royal Dublin Society.
Scottish Geographical Magazine.
Smithsonian Contributions to Knowledge.
Smithsonian Miscellaneous Collections.
Symons's Meteorological Magazine.
Tijdschrift van het Koninklijk Nederlandsch Aardrijkskundig Genootschap.

In addition to the works summarised in the above lists, a large number of books and pamphlets dealing with meteorological subjects have been received. Some of the more important are referred to on p. 36 of the Report.

The compilation of a complete bibliography of meteorological literature is included in the objects of the International Catalogue of Scientific Literature, and the necessity for the publication in full of the titles of all books and pamphlets received at the office is thereby obviated. It is intended to deal with the matter in due course in connexion with the catalogue of the Library.

APPENDIX VIII.

of INSTITUTIONS receiving PUBLICATIONS issued by the COMMITTEE.

ıSERVERS contributing returns printed in one of the periodical cations receive a copy of the publication. The Committee ıst that the copies may be returned to the Office after the ver has no personal use for them, in cases where they are not in a public library or other institution where the public can ılt them.

e *Daily Weather Report* is sent to seaports and to a few s in London for exhibition.

e *Annual Report* is sent to all observers at land stations in ıxion with the Office who express a wish to receive it.

riodical or occasional publications are sent to the institutions d in the following list, generally speaking, in exchange for cations received.

UNITED KINGDOM.		UNITED KINGDOM—*cont.*	
Offices:		Public Offices —*cont.*	
ıdeen ...	B.T., Supt. M.M.O.	London ..	Board of Agriculture.
ıaahot ...	School of Ballooning.		*†Board of Education, Science Museum.
	Balloon Factory (Col. Capper).		—— Solar Physics Observatory.
ımouth	B.T., Supt. M.M.O.		Board of Trade, Consultative Branch.
y ...	B.T. Surveyor.		—— Fisheries and Harbour Department.
ast ...	B.T., Supt. M.M.O.		—— Marine Department.
h ...	B.T., Supt. M.M.O.		—— Standard Weights and Measures Department.
tol ...	B.T., Supt. M.M.O.		—— Supt. M.M.O. Dock Street.
iff ...	B.T., Supt. M.M.O.		—— Supt. M.M.O. Poplar.
ımouth	Admiralty, Royal Naval College.		—— Supt. M.M.O. Tilbury.
	B.T., Supt. M.M.O.		—— Supt. M.M.O. Victoria Docks.
lin ...	Board of Agriculture and Technical Instruction.		British Museum, Dept. of Printed Books.
	General Register Office.		Chinese Maritime Customs.
	Ordnance Survey Office.		General Post Office.
lee ...	B.T., Supt. M.M.O.		General Register Office.
ıburgh...	Board of Fisheries.		*Imperial Institute.
	General Register Office.		Local Government Board.
	Royal Observatory.		National Physical Laboratory (Bushy House).
	*†Royal Scottish Museum.		—— (Kew Obs.).
gow ...	B.T., Supt. M.M.O.		—— (Eskdalemuir).
cester	B.T., Supt. M.M.O.		Trinity House.
nock ...	B.T., Supt. M.M.O.	Manchester	B.T., Supt. M.M.O.
ısby ...	B.T., Supt. M.M.O.	Middlesborough.	B.T., Supt. M.M.O.
lepool	B.T., Supt. M.M.O.		
...	B.T., Supt. M.M.O.		
ı ...	B.T., Supt. M.M.O.		
rpool ..	B.T., Supt. M.M.O.		
ion ...	Admiralty, Hydrographer.		
	—— Librarian.		
	*†—— Royal Naval College.		
	—— Royal Observatory.		
	Army Medical Department.		

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Public Offices —*cont.*	
Newcastle-on-Tyne.	B.T., Supt. M.M.O.
Newport ...	B.T., Supt. M.M.O.
Plymouth ...	B.T., Supt. M.M.O.
Shields North.	B.T., Supt. M.M.O.
Shields South.	B.T., Supt. M.M.O.
Southampton.	B.T. Supt. M.M.O.
	Ordnance Survey Office.
Sunderland	B.T., Supt. M.M.O.
Swansea ...	B.T., Supt. M.M.O.
Institutions:	
Aberdeen ...	Observatory.
Aberystwyth	The University.
Alnwick ...	Duke of Northumberland's Observatory.
Armagh ...	Observatory.
Aspatria ...	Royal Agricultural College.
Belfast ...	Queen's College.
Bexley Heath	Editor, Findlay's Sailing Directions.
Bidston ...	Liverpool Observatory.
Birkenhead	"Conway" Training Ship.
Birmingham	Central Free Library.
	Midland Institute.
	University, Librarian.
Birr Castle...	Observatory.
Cambridge...	Cavendish Laboratory.
	Observatory.
	Philosophical Society.
	Schuster Reader in Meteorology.
Cardiff ...	University College.
Cirencester...	Royal Agricultural College.
Dublin ...	Royal Dublin Society.
	Royal Irish Academy.
	Trinity College.
Dundee ...	Brown, C. H. (Agent).
	International Commission for Investigation of North Sea.
	University College.
Durham ...	Observatory.
Edinburgh...	Royal Scottish Geographical Society.
	Royal Society.
	*†Scottish Meteorological Society.
	University Library.
Falmouth ...	Observatory.
	Royal Cornwall Polytechnic Society.
Glasgow ...	"Nautical Magazine."
	Observatory.
Greenhithe	"Worcester" Training Ship.

United Kingdom—*cont.*	
Institutions—*cont.*	
Hull ...	Shipmasters' Association.
Jersey ...	St. Louis Observatory.
Leeds ...	University.
Leith ...	Nautical College.
Liverpool ...	Free Public Library.
	Mercantile Marine Service Association.
	Nautical College.
	Richardson, Spence & C.
	Underwriters' Rooms.
	University, Physical Laboratory.
London ...	Aeronautical Society.
	British Association.
	British Balneological and Climatological Society.
	Eastern Telegraph Co.
	*Guildhall Library.
	Institution of Civil Engineers.
	*†Lloyd's.
	London Institution.
	Metropolitan Water Board.
	*British Rainfall Organisation.
	"Nature."
	Navigation School.
	Royal Astronomical Society.
	Royal Botanic Society.
	Royal College of Science.
	Royal Geographical Society.
	Royal Institution of Great Britain.
	*†Royal Meteorological Society.
	Royal National Lifeboat Institution.
	Royal Society.
	*Royal United Service Institution.
	Sailors' Palace.
	School of Economics.
	"Shipping Gazette."
	Society of Arts.
	University College.
Manchester	Philosophical Society.
	University, Meteorological Department.
Markree ...	Observatory.
Northampton	Natural History Society.
Oxford ...	Clifton, Prof. R. B.
	Radcliffe Observatory.
	School of Geography.
Plymouth ...	Incorporated Chamber of Commerce.
	Marine Biological Laboratory.

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ıtions—	
t.	
thampton	Forbes, Capt. (Agent).
thport ...	Fernley Observatory.
th	Marine Schools.
Shields.	
nford ...	Free Library.
ıyhurst	Observatory.
quay ...	Natural History Society.
ncia ...	Observatory.
k ...	Philosophical Society.

British Colonies and Dependencies.

Australasia.

ide ...	Commonwealth Bureau of Meteorology.
	Public Library.
ane ...	Commonwealth Bureau of Meteorology.
	Public Library.
rt ...	Commonwealth Bureau of Meteorology.
urne ...	*†Commonwealth Bureau of Meteorology.
	Commonwealth Statistical Bureau.
	Department of Agriculture.
	Observatory.
	Public Library.
... ...	Commonwealth Bureau of Meteorology.
y ...	Commonwealth Bureau of Meteorology.
	Public Library.
	Royal Society of New South Wales.
ngton ...	Colonial Museum.
sor ...	Observatory.

Canada.

real ...	McGill University.
to ...	*†Meteorological Office.
ria (B.C.)	Meteorological Office.

India and Eastern Asia.

abad ...	Meteorological Reporter.
alore ...	Meteorological Department.
ay ...	Observatory.
tta ...	Director General of Observatories.
	Surveyor General.
Dun ...	Trigonometrical Survey.
Kong ...	Observatory.
ikanal ..	Observatory.
... .	Director General of Observatories.
pore ...	Principal Civil Medical Officer.

British Colonies and Dependencies—*cont.*

Mediterranean.

Malta	Observatory.

South Africa.

Bloemfontein	Grey College.
Cape Town ...	Observatory.
	Meteorological Commission.
Durban ...	Natal Observatory.
Johannesburg	Transvaal Meteorological Department.

Indian Ocean.

Mauritius ...	Meteorological Society.

West India Islands.

Jamaica ...	Government Meteorologist.

Europe.

Austria-Hungary.

Brünn ...	Natural History Society.
Buda-Pesth ...	Central Meteorological Institute.
Cracow ...	Observatory.
Fiume ...	Nautical Academy.
Innsbruck ...	Observatory.
O'Gyalla ...	Observatory.
Pola	Hydrographic Office.
Prague ...	Hydrographic Office.
	Observatory.
	Royal Society of Sciences.
Trieste ...	Observatory.
Vienna ...	Austrian Meteorological Society.
	Central Hydrographical Bureau.
	*†Central Meteorological Office.
	*Hann, Hofrath Dr. J.

Belgium.

Brussels ...	*†Observatory (Uccle).
Ostend ...	Navigation School.

Bulgaria.

Sofia	Central Meteorological Station.

Denmark.

Copenhagen ...	Hydrographic Office.
	International Council for the Study of the Sea.
	Meteorological Institute.
	Society of Sciences.

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Europe—*cont.*

France.

Bordeaux ...	Society of Oceanography of the Gulf of Gascony.
Lyons	Observatory.
Marseilles ...	Meteorological Commission.
Paris	*†Central Meteorological Office.
	Hydrographic Office.
	Hydrometric Service.
	Institute of France.
	Meteorological Society.
	Municipal Observatory
Perpignan ...	Meteorological Commission.
Puy-de-Dôme	Observatory.

Germany.

Aachen ...	Meteorological Station.
Berlin ...	Hydrographic Office.
	*†Meteorological Institute.
Bremen ...	Meteorological Observatory.
Carlsruhe ...	Central Meteorological Office.
Darmstadt ...	Hydrographical Bureau.
Dresden ...	Meteorological Institute.
Frankfort ...	Physical Society.
Gotha	M. Justus Perthes' Geographical Institute.
Greifswald ...	Geographical Society.
Halle	Leopold-Carolin Academy.
Hamburg ...	*†Deutsche Seewarte. Schück, Capt. A.
Kiel	Commission for the Exploration of the German Ocean.
Leipzig ...	University Library.
Lindenberg ...	Royal Prussian Aeronautical Observatory.
Magdeburg ...	Observatory.
Munich ...	Central Meteorological Office.
	Observatory.
Neustadt ...	Forest Academy.
Potsdam ...	Observatory.
Strassburg ...	Meteorological Agricultural Service.
Stuttgart ...	Central Meteorological Office.
Wilhelmshaven	Observatory.

Europe—*cont.*

Greece.

Athens ...	Observatory.

Italy.

Catania ...	Meteorological vatory.
Florence ...	Observatory.
Milan	Observatory.
Moncalieri ...	Observatory.
Naples ...	Observatory.
Palermo ...	Observatory.
Pesaro ...	Observatory.
Riposto ...	Observatory.
Rome	Central Meteoro Office.
	International A tural Institute
Turin	Observatory.
Venice... ...	Hydrographical Observatory.

Netherlands.

Amsterdam ...	Geographical Soc Meteorological tute.
Helder ...	Institute for the of the Sea.
Utrecht, (De Bilt).	*†Royal Meteoro Institute.

Norway.

Christiania ...	Meteorological tute.

Portugal.

Coimbra ...	Observatory.
Lisbon ...	Observatory.

Azores.

Ponta Delgada	Observatory.

Roumania.

Bucharest ...	Meteorological tute.

Russia.

Dorpat ...	Observatory.
Ekaterinburg	Observatory.
Helsingfors ...	Society of Scienc
Kazan ...	Observatory.
Kieff	Observatory.
Koutchino ...	Aerodynamical tute.
Moscow ...	Observatory.
Nicolaieff ...	Hydrographic Of
Odessa ...	Observatory.
Pavlovsk ...	Observatory.

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Europe—*cont.*	
***Russia*—cont.**	
Petersburg	*†Nicolas Central Physical Observatory.
	Hydrographic Department.
	Imperial Institute of Forestry.
is	Observatory.
rsaw ...	Meteorological Bureau.
Servia.	
grade ...	Central Observatory.
Spain.	
rcelona ...	Experimental Farm.
anada ...	Cartuja Observatory.
ardia ...	Observatory.
drid ...	Central Meteorological Institute.
	Observatory.
	Observatory, Chamartin de la Rosa.
laga ...	Society of Sciences.
n Fernando	Observatory.
rtosa ...	Ebro Observatory.
lafranca del Panades.	Observatory.
Sweden.	
ckholm ...	Central Meteorological Institute.
	Hydrographic Office.
	Nautical Meteorological Bureau.
	Royal Academy.
sala ...	Meteorological Observatory.
Switzerland.	
ne	Hydrometrical Bureau.
eva ...	Geographical Society.
t Blanc ...	Observatory.
châtel ...	Observatory.
ich... ...	Central Meteorological Office.
Africa.	
giers ...	Meteorological Service.
ro	Sanitary Department.
	*† Survey Department.
America.	
United States.	
altimore ...	Maryland Weather Service.
ambridge, Mass.	Harvard College Observatory.
America—*cont.*	
***United States*—cont.**	
New York ...	American Geographical Society.
	Central Park Observatory.
	State Hydrographer.
	State Library.
Philadelphia ...	American Philosophical Society.
	Franklin Institute.
Reno	Mount Rose Observatory.
Washington ...	Chief Signal Officer.
	Department of Agriculture.
	Department of Terrestrial Magnetism.
	Hydrographer's Office.
	Mount Weather Observatory.
	Naval Observatory.
	Smithsonian Institution.
	Surgeon General's Office.
	*†Weather Bureau.
Mexico.	
Guanajuato ...	Observatory.
Mexico ...	"Antonio Alzate" Scientific Society.
	Central Meteorological Observatory.
Oaxaca ...	Observatory.
Puebla ...	Boletin de Estadistica.
Saltillo ...	Observatory.
San Luis Potosi.	Observatory.
San Salvador	Observatory.
Central America, West Indies.	
Costa Rica ...	Meteorological Institute.
Guatemala ...	Central Laboratory.
Havana ...	Observatory.
	Central Meteorological Station.
Porto Rico ...	Engineer in Chief.
Argentina.	
Buenos Aires..	Meteorological Office.
	Mons. Lasagna Observatory.
Cordoba ...	National Academy.
Brazil.	
Porto Alegre...	Azambuja, Sr. G. A. de
Rio de Janeiro	Meteorological Department, Ministry of Marine.
	Observatory.
São Paulo ...	Secretary of Agriculture, &c.

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America—*cont.*		
Chile.		
Valparaiso	...	Meteorological Service.
Ecuador.		
Quito...	...	Observatory.
Uruguay.		
Monte Video	...	National Physical Institution.
		Observatory, Villa Colon.
Asia.		
Batavia	...	Observatory.
Beyrout	...	Lee Observatory.
Chemulpo	...	Observatory.
Irkutsk	...	Observatory.
Manila	...	Meteorological Observatory.
Tokio ...	...	Imperial Meteorological Observatory.
Zi-ka-wei	...	*Observatory.

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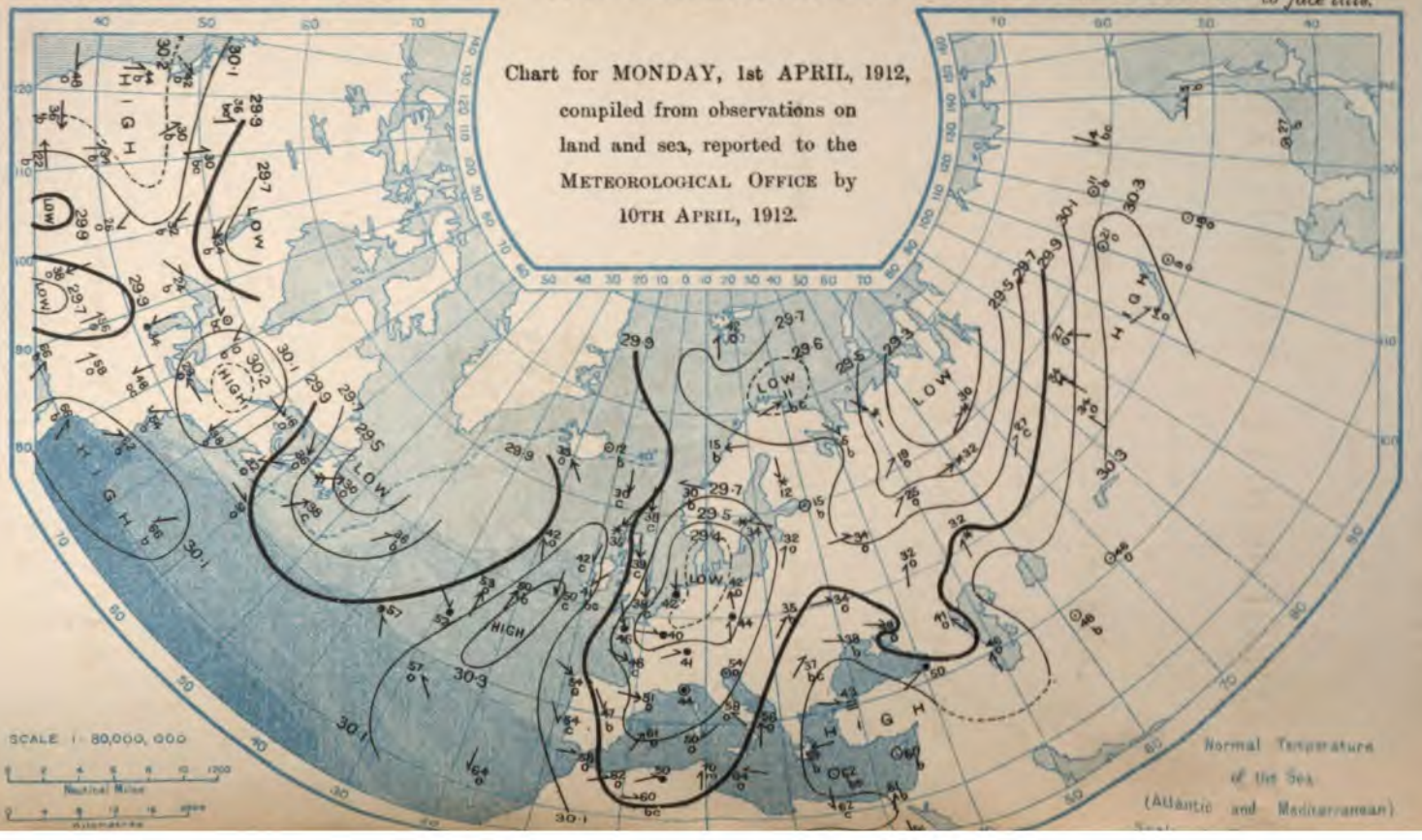
SEVENTH ANNUAL REPORT OF THE METEOROLOGICAL COMMITTEE, 1911-1912. *Frontispiece to face title.*



SEVENTH ANNUAL REPORT

OF THE

METEOROLOGICAL COMMITTEE

TO THE

LORDS COMMISSIONERS OF HIS MAJESTY'S TREASURY.

For the Year ended 31st March, 1912
(the Fifty-seventh Year of the Meteorological Office).

Presented to both Houses of Parliament by Command of His Majesty.

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THE METEOROLOGICAL COMMITTEE, 1911-12.

Constituted by Minutes of the Lords Commissioners of H.M. Treasury, dated 20th May, 1905, and 31st March, 1910.

Date of Appointment.	
April 1, 1910	... Mr. W. N. SHAW, Sc.D., F.R.S., Director, *Chairman.*
„ „	... Rear-Admiral H. E. PUREY CUST, R.N. Hydrographer to the Navy.
„ „	... Captain J. M. HARVEY, Principal Examiner of Masters and Mates, Board of Trade, Nominated by the Board of Trade.
„ „	... T. H. MIDDLETON, M.A., M.Sc., Assistant Secretary of the Board of Agriculture and Fisheries. Nominated by the Board of Agriculture.
„ „	... Sir GEORGE H. DARWIN, K.C.B., F.R.S., University of Cambridge. Nominated by the Royal Society.
„ „	... Professor ARTHUR SCHUSTER, F.R.S., University of Manchester. Nominated by the Royal Society.
„ „	... Mr. G. L. BARSTOW. Nominated by the Treasury.

Subject to the discretion of the authorities by which they were respectively nominated, the members of the Committee hold office for a period not exceeding five years, but are eligible for reappointment.

THE GASSIOT COMMITTEE OF THE ROYAL SOCIETY, 1911-12.

Appointed in accordance with Treasury Letter of 26th February, 1910, by the Royal Society on 17th March, 1910, to administer the Gassiot Trust, and to promote the scientific study of the branches of science to which the Trust relates, viz., Meteorology, Terrestrial Magnetism, Atmospheric Electricity, Seismology, and the cognate subjects.

The Officers of the Royal Society :—

President	... ...	Sir Archibald Geikie, K.C.B.
Treasurer	... ...	Sir A. B. Kempe.
Secretaries	... ...	Sir Joseph Larmor, M.P. Sir J. Rose Bradford.
Foreign Secretary	...	Sir William Crookes, O.M.

Dr. C. Chree.

Sir George Darwin, K.C.B.

Mr. W. H. Dines.

Mr. F. W. Dyson (*Astronomer Royal*).

Dr. R. T. Glazebrook, C.B.

Captain H. G. Lyons.

Prof. H. F. Newall.

Prof. J H. Poynting.

Sir Arthur Rücker.

Prof. E. Rutherford.

Prof. A. Schuster.

Dr. W. N. Shaw.

Dr. G. T. Walker.

Mr. G. W. Walker.

Mr. C. T. R. Wilson.

Secretaries : Dr. C. Chree.
Mr. R. W. F. Harrison.

THE STAFF OF THE METEOROLOGICAL OFFICE AND OF THE OBSERVATORIES OF THE METEOROLOGICAL COMMITTEE, 1911-12.

DIRECTOR.

William Napier Shaw, LL.D., Sc.D., F.R.S.

METEOROLOGICAL OFFICE.

MARINE DIVISION.

Marine Superintendent ...	M. W. Campbell Hepworth,* C.B., R.D., Commander, R.N.R.
Principal Assistant	... W. Allingham.
Assistants ...	... W. G. James, C. H. Thompson.
Clerks	... J. T. Williams, H. Keeton. Misses E. D. Anderson, D. Buckeridge, R. E. Smith.
Boy Clerks ...	... A. Lovie,† A. J. Tabor.†

FORECAST DIVISION.

Superintendent ...	... R. G. K. Lempfert,* M.A.
Principal Assistant	... F. J. Brodie.*
Forecast Assistants	... H. Harries,* R. Sargeant.*
Clerks	... A. R. Simpkins, F. W. Snell; A. T. Bench, W. Hayes,† A. G. W. Howard.†
Boy Clerk ...	... R. Pyser.†

STATISTICS AND LIBRARY DIVISION.

Superintendent ...	... E. Gold,* M.A.
Principal Assistant	... T. Duncan Bell.
Assistants ...	... A. H. Bell, A. J. Rigby, J. Sheerman.
Clerks	... C. A. Bracey, C. W. Heinemann, L. H. Powers.
Clerk Assistants ...	... C. E. P. Brooks,† P. N. Skelton.†
Supernumerary Clerks	... A. E. Pycock, W. Tomkins.†
Probationer ...	... M. T. Spence.
Boy Clerk ...	... M. H. Megrah.

INSTRUMENTS DIVISION.

Superintendent ...	... R. H. Curtis.
Assistant	... R. F. Wallace.
Boy Clerk ...	... C. G. West.

* Inspectors of Meteorological Stations.

† Members of the corps of observers for the instruments installed at the office.

Laboratory, Workshop, and Drawing Office.

Mechanical Assistant ... J. H. James.†
Photographic Assistant ... Miss E. C. Humphreys.
Attendant ... ... B. G. Brame.

Correspondence and Accounts.

Chief Clerk and Cashier... John A. Curtis.
Clerk ... ... E. J. Hood.
Clerk Assistants... ... E. L. Ardley, H. L. B. Tarrant.
Typist ... ... Miss A. Turney.
Boy Clerk ... ... N. C. Bradnock.
Office Keepers ... ... W. H. Parsons, A. G. Goad.
Senior Messenger ... C. E. Goad.
Office Messenger ... ... W. J. Winter.

4 Boy Messengers, 4 Cleaners.

Secretary to the Director and Clerk of Publications. } R. Corless,* M.A.

Graduate Assistants ... H. W. Braby,† B.A. (South Kensington).
G. Dobson, B.A. (Kew).

Additional Inspector ... A. Watt,* M.A., Secretary Scottish Meteorological Society.

Lithographers—Messrs. Wyman & Sons, Ltd. (A. G. King, *Artist*).

* Inspectors of Meteorological Stations.
† Member of the corps of observers for the instruments installed at the Office.

SEVENTH ANNUAL REPORT

OF THE

METEOROLOGICAL COMMITTEE

TO

THE LORDS COMMISSIONERS OF HIS MAJESTY'S TREASURY,

'or the Year ended 31st March, 1912—the Fifty-seventh year of the Meteorological Office.

[AY IT PLEASE YOUR LORDSHIPS,

Meetings of the Committee have been held on 5th April, th July, 1st November, 6th December, 1911, and on 7th February, 0th March, 1912. No change has taken place in the membership f the Committee during the year.

The organisation of the work of the Office in the new premises as claimed a good deal of attention. Other important items which ave also occupied the attention of the Committee have been (1) the consideration of the intimate relations between the Meteorological ffice and the Post Office with regard to the international exchange f telegraphic weather reports from stations in this country and broad, which has eventuated in priority, under the Telegraph Acts, ging given to certain classes of meteorological telegrams and storm warnings; (2) the incorporation in the official network of ations, by agreement with the Royal Meteorological Society, of ie normal and auxiliary climatological stations which have hitherto ported their observations to the Society and since the beginning f 1912 have been transferred to the Office; (3) the revision of the heme of publications in order to provide for these new stations nd also for the results of observations in Terrestrial Magnetism, tmospheric Electricity and Seismology recorded at the Observatories in connexion with the Office; and (4) the revision of the ules under which daily telegraphic reports from Health Resorts re accepted for communication to the Press, in order to secure reater efficiency and to relieve the Office of part of the increasing xpense of dealing with that service. Efforts have also been made o provide greater facilities for the distribution of forecasts to rural ost offices in the interests of agriculture and the fisheries on the ne hand, and to local authorities for the use of municipal surveyors nd engineers on the other, but so far without any substantial esult.

Office and Observatory Staff.—The staff has been enlarged in the course of the year by the appointment of Mr. L. Southerns, B.A., of Emmanuel College, Cambridge, as Professional Assistant in Seismology at Eskdalemuir in connection with the installation of an Omori Seismograph lent for two years by the Japanese Government at the suggestion of Professor J. Milne, F.R.S. For this appointment and for incidental expenses within the two years, the Royal Society, at the request of the Gassiot Committee, provided the sum of £450, on the understanding that at the termination of the period no further grant would be made. For the purpose of advanced study and research in atmospheric electricity, chiefly at Kew Observatory, Mr. G. Dobson, B.A., Research Student of Gonville and Caius College, has been accepted for one year from 1st October, 1911, as Graduate Assistant. Mr. H. W. Braby, B.A., has been accepted as Graduate Assistant for one year at the Office with special reference to the examination of the manuscript records from British Colonies and their co-ordination with the reports received at the Office from various parts of the Empire. In connexion with the additional work in the statistical division, Mr. T. H. Spence, whose father, Mr. Magnus Spence, master of the public school at Deerness, Orkney, has acted as curator of an anemometer and has contributed observations to the Office for many years, has been accepted as probationer, and an additional boy messenger has been appointed therein. Otherwise the numbers of the staff have remained the same, but there are two retirements on superannuation allowance to which reference should be made. In both cases the officials whose tenure has now come to an end originally joined the staff of Admiral Fitz Roy's office in Parliament Street more than fifty years ago.

Mr. Charles Harding, who retired on 30th September, was principal assistant in the Marine Division of the Office for 37 years, and Mr. Richard Henry Curtis, whose retirement dates from the close of the year, was largely concerned with the mechanical processes devised by the Meteorological Committee of the Royal Society for reproducing the autographic records of the observatories, and took a large personal share in the work of the office in connexion with the automatic recording of wind and sunshine. For many years he prepared for the press the results of the work of Observatories, and in 1907 he became Superintendent of the Instruments and Observatories Division of the Office, the operations of which have become very important, as the Division has to deal with the supply of large numbers of meteorological instruments to the Navy, the Dominions and Colonies, and the Office stations.

Both these officials contributed a number of important papers to the Journal of the Royal Meteorological Society and other scientific publications which have taken a recognised position in meteorological literature.

Mr. William Allingham, Nautical Assistant, has succeeded Mr. Charles Harding as Principal Assistant in the Marine Division. Mr. Curtis's successor has not yet been appointed.

The New Premises.—The fitting of the rooms at the new Office with ordinary furniture by H.M. Office of Works has been completed as indicated in last year's report. A number of items of special

furniture, fittings and instruments, among which may be mentioned various stands and screens for apparatus on the roof, and a relief map of the British Isles on the scale of one millionth with a glass case for it in the ante-room, have been provided out of the accumulated balance of Office funds.

There are still a large number of bundles of documents and records for which the Committee have been unable to provide suitable accommodation, and some additional accommodation for the display of objects of interest in the museum and the storage of working forms is required, but the available funds have been exhausted.

Early in the year it appeared that difficulties were likely to arise about the regular production of the Daily Weather Report from the Meteorological Office Press, unless a duplicate machine were provided to meet the requirements in case of breakdown. The contract for the printing of the Weekly Weather Report and Monthly Weather Report was due for renewal or alteration at the close of 1911, and H.M. Stationery Office urged the advantage of having the lithography of these reports also carried out on the Office premises. The Committee accordingly made arrangements for setting free the portion of the large room in the basement which they had reserved for a workshop, in order to accommodate another lithographic machine. This necessitated the transfer of the clerical staff concerned with the work of the observatories to one of the bays in the Library, so that a room on the second floor under the Laboratory might be set free for a workshop. To do this the Committee have had to rely on the courtesy of the Director of the Science Museum, who has stored for them temporarily the large glass case which occupied the bay now required for clerks. The Office is therefore still somewhat hampered for accommodation. After the surrender of the necessary space a good deal of delay took place in installing the second lithographic machine, but it is now in operation and the charts for the Weekly and Monthly Reports have been produced at the Meteorological Office Press since the beginning of 1912.

The display of instruments, records, &c., in the new premises has been received with a good deal of appreciation by the public. Judging by occasional communications received at the Office, the maps in the case outside the Office and the recording instruments in the street lobby are objects of interest to the public on various grounds; and a considerable number of parties of visitors from Polytechnics and other educational bodies have visited the Office by appointment on Saturday afternoons. The convenience of a mechanical workshop on the premises is of the greatest assistance, not only for the local work of the Office but in dealing with many of the varied questions which arise in connexion with the supervision of a large number of stations at a distance.

Rules have been drawn up for the use of the Library under the new conditions.

Yielding to the representations of H.M. Office of Works, and in pursuance of the terms of the lease, the Committee have found it necessary to make provision for the night watching of the premises, regular attention to the appliances for heating and

lighting, and regular attendance on the lift, on a scale somewhat out of keeping with the traditional practice of the Office during its occupation of premises in Victoria Street.

Before passing from the consideration of the new premises the Committee desire to place on record their thanks for the contribution by private subscription of three bronze memorial tablets for the show cases in the hall of the first floor of the Office, and also for two carvings of a device bearing the Office monogram over the main door on either side of it. All these were executed by the Bromsgrove Guild under the supervision of the architects' department of the Office of Works. The bronzes include medallions in low relief of Admiral R. FitzRoy, Superintendent of the Meteorological Department of the Board of Trade; General Sir R. Sabine, President of the Royal Society, Chairman of the Meteorological Committee of the Royal Society, and Dr. R. H. Scott, Director of the Office; Professor H. J. S. Smith and Sir Richard Strachey, Chairmen in succession of the Meteorological Council. For contributions toward the cost of these valuable additions to the decoration of the Office the Committee are indebted to Mr. F. C. Bayard, Professor L. Becker, Mr. C. J. P. Cave, Dr. H. N. Dickson, Vice-Admiral Sir A. Mostyn Field, Mr. R. Inwards, Mr. E. Kitto, Mr. W. Marriott, Mr. H. Mellish, Mr. R. E. Middleton, Professor C. Niven, Professor J. H. Poynting, Colonel H. E. Rawson, Sir A. W. Rücker, Rev. W. Sidgreaves, Sir J. Wrench Towse, as well as to a large number of past and present members of the staff of the Office. The balance of the cost has been met by contributions from members of the Committee.

Meteorological Telegrams.—One of the reasons put forward for the removal of the work of the Office from Victoria Street to South Kensington was that it would enable the meteorological work to be associated with the telegraphic work, upon which it depends for the Daily Weather Service, in one building on the site belonging to the Commissioners for the Exhibition of 1851. As the Meteorological Office deals with some 200 telegrams a day, on the average, telegraphic facilities are essential for its success. The removal to new premises has resulted in some unexpected developments. As noted in last year's Report, arrangement was made with the Post Office while the building was being erected for the delivery of the meteorological telegrams to be effected by pneumatic tube from the floor below the Forecast Room instead of by private wire from the Central Telegraph Office or by messenger from a neighbouring telegraph office in Victoria Street. After the new system had been in operation for some months the Post Office notified its intention of making a substantial charge for delivering the telegrams before 8 a.m., or after Post Office closing time on Sundays, and reduced the facilities for communication with the Central Telegraph Office, which had been enjoyed for many years with the private wire at Victoria Street, to those afforded to any other "private person." The Post Office offered to revert to the traditional practice if the Meteorological Committee were willing to give up delivery by tube and substitute a private wire.

The Committee remained, however, of the opinion that from the general point of view it is uneconomical for the Meteorological

Office to include in its technical staff a sufficiently large number of expert telegraphists to be ready to attend to the instruments at any time between 7.15 a.m. and 8.30 p.m., who could only be fully occupied with telegraphy for two or three hours a day in the aggregate. Since both the Post Office and the Meteorological Office were Government institutions it seemed to them better for the telegraphy to be done by post office telegraphists in the same building, leaving the Meteorological Office staff excused from adding telegraphy to its accomplishments.

They therefore prepared a memorandum setting out the complicated international relationships involved on behalf of this country in the exchange of meteorological telegrams with the various governments or government institutes of Europe, and appealed on the one hand to Your Lordships for special consideration under the Telegraph Acts to be given to the telegrams, and to the Post Office on the other, pointing out the advantages of the delivery by tube as arranged in the new building, and asking for exception to be made in the case of the Meteorological Office in regard to the communication with headquarters about the working of the telegraphic business.

To Your Lordships the Committee are gratefully indebted for having requested the Postmaster-General to arrange for priority to be given, under the Telegraphs Acts, to certain classes of meteorological telegrams and to storm warning telegrams, and to the Postmaster-General they are equally indebted for giving effect to Your Lordships' request.

They were looking forward to an equally favourable reply from the Postmaster-General on the other points, but it had not arrived when the year closed. On May 1st of the current year, however, a reply was received intimating that a careful examination had disclosed that by having the foreign telegrams sent to the South Kensington Office by wires which the public may use, instead of by wire reserved for the private use of the Office, charges amounting to £400 a year additional to those which have been customary since 1879 had become payable. They are informed that the charge will be waived if the Office hires two telephone circuits for its special use between the Central Telegraph Office and the Meteorological Office. The matter is still under consideration.

The Distribution of Weather Forecasts.—In view of the fact that forecasts have been prepared in the Office twice a day, and during the summer months three times a day, since 1879, and that evidence as to the improved accuracy and the occasional utility of the forecasts has been accumulating in recent years, the Committee have thought it desirable to seek a considerable extension of the means of distribution of the forecasts in order to make an adequate test of the utility of the system. The experience of the Office in regard to the Admiralty in this respect is reassuring. Commencing in January, 1911, in compliance with a request from their Lordships, an abbreviated report and general forecast have been drawn up each evening for distribution by radio-telegraphy to H.M. ships in home waters, and before the end of the year a letter was received stating that the evening message had been found useful and asking on that ground for a corresponding message each morning; this

also has been supplied since 1st March, 1912. It is, however notorious that the facilities afforded by the preparation of the fore casts are not used to nearly their full extent. The method of dis tribution by supplying type-written copies overnight for publicatio in the morning papers lacks utility because the forecast is not i the hands of the reader until a large part of its period has alread expired. Distribution must be by telegraph if the full advantag is to be secured. The Committee are of opinion that a satisfactor judgment as to the utility of forecasts can only be arrived at b their regular daily use for a long period. The use of forecast distributed from a central office as a practical guide in arrangin the day's work, in place of the customary signs of the sky, require practice and habit which cannot be obtained by an occasiona inquiry on special occasions or by regular transmission for shor periods. According to the most recent Office figures, out of 36 forecasts issued in a year 343 are more nearly right than wrong but on the average 22 are failures, partial or complete. In som circumstances the impression produced by one failure may easil outweigh that of 15 complete or partial successes; there is a bette chance of 22 failures being estimated at their true value in relatio to 343 successes; still more of 1,715 successes being brought int proper relation with 110 failures. On that account the Committe decided to ask for a trial extending over five years.

In order to provide for the telegraphic distribution of forecasts fo the use of agriculturists and others, application was made through th Treasury for a grant of £5,000 from the Development Fund to b spent on telegraphy. With the view of preparing a scheme of dis tribution inquiry was made of the Postmaster-General as to th cost of distributing a forecast message to all the post offices in Grea Britain and Ireland. The reply was to the effect that, taking th number of post offices at 8,218 and the number of words in a fore cast at 15, the cost of the telegrams would be £106,234 a year, an reference was made to a reply of similar tenour by Mr. Fawcet Postmaster-General in 1882.

The Committee are unable to accept this as an adequate repr sentation of the position, because if £100,000 appeared on th expenditure side of the Meteorological Office account for telegram it would also appear on the receipt side of the Post Office account and so far as the actual figures are concerned the two items i the accounts presented by the Comptroller and Auditor-Genera would cancel out and leave no real information as to cost. The Com mittee were thus disappointed to find that even if the applicatio for £5,000 had been approved it would only have been available fo the distribution of forecasts to the same area as a "private person could reach with telegrams on private business for the same sum.

In the end, after consideration, the Development Commissioner ruled that the grant was not within their powers under the Develo ment Act because the application, as set out by the Committee, w partly based on the ground of general public utility and n essentially on that of the development of Agriculture or Fisheries

While this application was under consideration by the Com missioners a deputation consisting of Mr. A. T. Davis, M. Ins C.E., M.I.Mun.Cy.E., F.S.I., County Engineer of Shropshire

Mr. R. A. Ryves, A.M.Inst.,C.E., F.R.Met.Soc.; and Mr. H. G. Turner, A.M.Inst.C.E., Assistant Engineer and Surveyor, Surbiton District Council, waited on the Director of the Meteorological Office on 12th October, 1911, for the purpose of submitting the following resolution adopted at a conference of Municipal and County Engineers, 29th April, 1911 :—

"That this Conference of road engineers and others interested in the improvement of the roads of this country is strongly of opinion that it would be a facility and economy in connection with the branch of Local Government work referred to, as well as in relation to other branches of Municipal Engineering, if His Majesty's Meteorological Department could establish a system of weather forecasts, localised as far as practicable, and telegraphed daily to Municipal and County Offices or Post Offices in as many districts as practicable throughout the country."

The resolution has been supported by the communication of resolutions from the following :—

The Borough Surveyor, Douglas, Isle of Man.
The Surbiton District Council.
The Liversedge Urban District Council.
The Spen Valley Literary and Scientific Society.
The Irish County Councils' Officials' Association.
The Institution of Water Engineers.
The Teddington Urban District Council.
The Ruislip-Northwood Urban District Council.
The Corporation of the City of Gloucester.
The Merton Urban District Council.
The Town Council, Felixstowe.

A copy of the resolution with a letter setting out the position was forwarded to the Road Board on 2nd November, 1911, but a final reply had not been received at the close of the year.

The movement which was initiated by the Conference of Road Engineers elicited a certain amount of support for the proposal to undertake the distribution of the forecasts and also incidentally a certain amount of adverse opinion which was based mainly upon considerations of the inaccuracy of forecasts and the reasons for it. That, however, does not fully represent the point at issue. There are comparatively few people in the country to whom the weather is always a matter of indifference, so that in making plans for to-morrow the greater number have, somehow or other, to take account of what the weather is going to be. They may of course form their judgment by their own or their friends' experience, or make no provision of their own, but protect themselves by insurance or otherwise against the consequences. The real question is whether, with forecasts which are substantially correct nine times out of ten, the public would in the long run and in the aggregate be better off by more than the cost of distributing the information. To the Committee it seems that such a point can only be properly determined by an adequate trial, for which at present the facilities do not exist.

Daily Reports to the Newspaper Press from Health Resorts.—A development which is concerned with the voluntary contribution of

data to the office, but which was initiated quite independently of the negotiations with the Royal Meteorological Society, to be referred to later, is the reorganisation of the supply of the information contributed by the health resorts for communication to the newspaper press. When the recording of sunshine was a novelty some twenty-five years ago the office accepted telegrams giving the records of sunshine up to 6 p.m. daily and communicated them, with the evening reports and forecasts, to newspapers and press agencies. For many years only sunshine was reported, but recently the available space in the telegram has been used for the other meteorological data of a 6 p.m. report, on the same lines as those of the telegraphic reporting stations. Of the data thus communicated the figures for sunshine have been reported to the newspapers and the remainder have formed an interesting table on the fourth page of the Daily Weather Report.

The official publication of data involves the supervision of the stations to see that the international conventions are understood and complied with, and this again involves the periodical inspection of the stations. It is the rule of the Office for its own stations which supply information for the Daily Weather Report to be visited by an inspector from the Office each year, but it has not been regarded as necessary to visit the voluntary stations more than once in three years. The communication of data from health resorts has grown in recent years to such an extent that the Committee thought it desirable to issue officially a schedule of observations received each evening and not simply extract the figures for sunshine. This has become possible owing to the change in the method of delivering telegrams. But the juxtaposition of figures from various parts of the country implies careful supervision of the methods and instruments employed and to carry out the supervision effectively annual inspection is indispensable. This puts the Office to considerable additional expense for which no return is made because the information is supplied to newpapers without charge. The Committee have therefore decided to make a charge of £4 per annum against the stations, as being the sum which they estimate to represent the average cost of an inspection visit. The arrangements are complete for the commencement of the new scheme on 1st May, 1912, and there is every prospect that the system will be generally accepted.

Relations with the Royal Meteorological Society.—For many years it has been customary for the Meteorological Office to make a contribution to the funds of the Royal Meteorological Society and the Scottish Meteorological Society in consideration of the supply of schedules of observations, ready for printing in official publications, from stations which were associated with the societies, and of the periodical inspection of the stations. The origin of the custom is of some interest. The Meteorological Office as reorganised in 1867, after Admiral FitzRoy's death, was expected to deal with the meteorology of the ocean, with telegraphic reports from stations in the British Isles and the Continent, and with the explanation of the phenomena disclosed therein on a scientific basis, by means of the records of observatories with self-recording instruments similar to those which had then recently been established at Kew Observatory.

The Societies were already occupying themselves with the collection and discussion by their members of the meteorological data of amateur observers in all parts of the country, and the Office had no responsibilities in that direction. The data collected were published in the journals of the societies and others by the Registrars-General of Births, Deaths and Marriages, who were closely associated with the work of the Societies. Then came two International Congresses—one at Vienna in 1874, and another at Rome in 1879—which dealt with the organisation of meteorological work for the study of climate in all parts of the globe, and initiated the official publication of data from stations similar to those which the societies had organised.

Only few private observers contributed their observations to the Office, and to meet the international requirements the Office paid to the societies an annual sum on account of the expense of inspecting the selected stations and of preparing the schedules for publication. In 1878 the Office, under the Meteorological Council, began the issue of a Weekly Weather Report for agricultural and sanitary purposes, which was intended to develop the practical application of meteorological statistics. This required information from representative stations in all districts. Among the statistics were those of sunshine, for the measurement of which, with Sir G. G. Stokes's assistance, the Office had introduced an instrument. A large number of health resorts gradually became interested in the subject, and as a novelty the Office included the daily totals in their evening reports to newspapers, and thus by degrees the Office became an important centre for the collection of data from what are still known as voluntary stations, though in many cases they are maintained by local authorities. Meanwhile the societies developed independently their own system of publication, using in many cases the same data. Endeavours were made in 1905–6 to come to some understanding that would unify the independent schemes and avoid overlapping, but the negotiations fell through. All this time the payments by the Office to the Societies had been maintained, but in 1910 the Office gave notice to discontinue the payment for monthly schedules and for inspections in the case of the Royal Meteorological Society. The President and Council of the Society then decided that it would be best for the Society to discontinue its publication of the Meteorological Record, and ask its observers to contribute their information to the Office, which thenceforth would undertake the necessary inspection and supervision, with the understanding that a summary of the observations would be included in the Monthly Weather Report and that a copy of the report for official use would be presented to the contributors.

This proposal has been accepted by the Committee, who have also arranged with the Controller of H.M. Stationery Office for the supply to the Society, at cost price of printing and paper, of copies of the Monthly Report for distribution to the Fellows of the Society. The staff of the Society's office is thus relieved from the work of supervising and editing the results for stations which have been transferred to the Office, and the Office is relieved of the corresponding payment. But the Society propose to use their staff for the

preparation of climatological tables and charts for the British Isl which have long been recognised as urgently required. They ha asked for pecuniary help from the Committee in carrying out th scheme, and the Committee have included £50 in the estimate f 1912–13 on that account.

Branch Office at South Farnborough.—The arrangement for expe mental work in the investigation of wind structure for the Adviso Committee for Aeronautics under the direction of the Office h continued during the year, and the work has been carried on Pyrton Hill, the headquarters of the work for the Office in co nexion with the investigation of the upper air. The work w be transferred to South Farnborough as soon as the necessa accommodation is provided. In the meantime Mr. J. S. Din meteorologist in charge of the experiments, has been engaged up the completion of designs for a wind-recorder to give both directi and velocity upon the same sheet, and upon the observation vertical velocity by means of pilot balloons or tethered balloo The results of the investigation have been communicated to t Advisory Committee for Aeronautics and incorporated in i report.

Auxiliary Observatories.—In 1868 the Meteorological Committ of the Royal Society initiated the system of making annual gra to independent institutions in consideration of the maintenance observatories with self-recording meteorological instruments simil to those which had at that time been brought into operation at Ke Observatory. In addition to that at Kew, five observatories we established on these terms at Aberdeen, Glasgow, Stonyhurs Falmouth, and Armagh. An Observatory on similar lines Valencia was administered directly from the Office. In 1883 t Meteorological Council reduced its contribution in the case Glasgow, Stonyhurst, and Armagh, but after some negotiatio continued the allowance for the Falmouth Observatory, which w provided with a new site and buildings and to which was added, means of funds provided by the Government Grant Committee the Royal Society, an equipment for recording the terrest magnetic elements. With increasing difficulty the continu records of the meteorological and magnetic elements have b maintained by the Royal Cornwall Polytechnic Society by the a of grants from the British Association for the Advancement Science and the Government Grant Committee of the Roy Society.

In the autumn of 1911 the Society took the whole question o the maintenance of the Observatory into consideration, and o 9th December of that year Mr. Wilson Lloyd Fox, Honorar Secretary of the Observatory Committee, addressed a letter to th Office in which he announced the decision of the Society. "In vie of matters connected both with the finances and the personnel o the Observatory this Committee [of the Royal Cornwall Polytechni Society] do not see their way to continue the observations after th close of 1912, and feel it only due to the scientific authorities wh

have so long and so consistently supported the Falmouth Observatory that they be at once apprised of the fact."

This decision on the part of the Falmouth Observatory has raised the whole question of the continuance of the methods of recording on the model of Kew Observatory. The Committee are informed that the point of application of active meteorological inquiry has passed away from the questions for which the old form of recording instrument were alone suitable and that the urgency of questions connected with the upper air necessitates a new kind of activity of which the Observatories of 1868 took no account. They have therefore decided to withdraw the grants which are devoted simply to the continuance of observations in the old form, considering that the maintenance of continuity in the case of Kew, Valencia, Aberdeen, and in future of Eskdalemuir will be sufficient for the important questions of secular variations.

Publications.—The most important matters in connexion with publications which have come before the Committee are the arrangements for the presentation of the monthly and annual results obtained at the Observatories. The representation of daily values had already been provided for by the monthly issue of the *Geophysical Journal*, of which seven monthly issues beginning with January, 1911, were completed at the end of the year. The arrangements for *Hourly Values, Geophysical Section*, intended to embody the hourly readings of the magnetic instruments at Eskdalemuir and summaries of the hourly values of all other automatic recording instruments at Observatories in connexion with the Office, have been the subject of further prolonged consideration with the assistance of the Gassiot Committee of the Royal Society. The compilation of the data was not complete at the close of the year, but it is hoped that a proof of the results for the first year, 1911, may be ready for the meeting of the Gassiot Committee which is due to be held before the 1st July.

The issue of *Geophysical Memoirs* as a supplement to the *Geophysical Journal*, containing official reports and papers on meteorological and geophysical subjects, has been begun with three papers by Commander Hepworth, Mr. W. H. Dines, and Mr. G. W Walker.

The form of the Monthly Weather Report has been remodelled in order to take in the data for the large number of additional stations transferred from the Royal Meteorological Society.

These changes and enlargements have thrown much additional work upon the statistical division of the Office which prepares the publications for the press, and in consequence the publications are not so nearly up to date as they were last year. The delay, though unavoidable, is unintentional. The amount of material which passes through the Office for publication, coming from all parts of the country and from a number of colonies, is very large, and elaborate precautions for avoiding confusion are necessary unless the work of preparation for publication keeps pace with the receipt of the material.

The official publications issued or signed for press during the year are as follows :—

PERIODICAL.—The Daily Weather Report.
Monthly Meteorological Charts of the Atlantic Ocean and the Mediterranean.
Monthly Meteorological Charts of the Indian Ocean and the Red Sea.
The British Meteorological and Magnetic Year Book for 1911, comprising :—
Part I.—The Weekly Weather Report with Quarterly and Annual Summaries, A wind-force Supplement, and two Special Supplements giving additional results of the investigation of the upper air in the British Isles, and summaries for the year of the records obtained with kites and registering balloons and of the observations of sea temperature.
Part II.—The Monthly Weather Report with a summary for the year.
Part III. (1).—Daily Readings at Stations of the First and Second Orders.
Part III. (2).—Geophysical Journal. Daily readings in Meteorology, Solar Radiation, Seismology, Atmospheric Electricity, and Terrestrial Magnetism.
Part IV. (1).—Hourly Values : Meteorological Section (pressure, temperature, humidity, rainfall, and sunshine) for Kew, Eskdalemuir, and Valencia.
Part IV. (2).—Hourly Values : Geophysical Section (Terrestrial magnetism, atmospheric electricity, and meteorology) for five Observatories.
The Observer's Handbook. 1911 Edition.

OCCASIONAL.—Report of the Ninth Meeting of the International Meteorological Committee, Berlin, September 26-29, 1910.

GEOPHYSICAL MEMOIRS.—Vol. I., Part I. :—
No. 1. The Effect of the Labrador Current upon the Surface Temperature of the North Atlantic ; and of the latter upon Air Temperature and Pressure over the British Isles. By M. W. Campbell Hepworth, C.B. R.D., Commander, R.N.R., Marine Superintendent.
No. 2. The Free Atmosphere in the Region of the British Isles. Second Report by W. H. Dines, F.R.S., with a Preface by W. N. Shaw, Sc.D., F.R.S., Director.
No. 3. Graphical Construction for the Epicentre of an Earthquake, by G. W. Walker, M.A., Superintendent of Eskdale Observatory.

A book by the Director entitled *Forecasting Weather* and embodying the work of the Office in connexion with dynamical meteorology during the past twelve years was published in November, 1911, by Messrs. Constable & Co.

Other publications for which authority has been given and which are in preparation, but have not yet been issued, are as follows :—
Barometer manual for the use of Seamen—Seventh Edition.
Climatological Report for certain British Stations overseas.
The Computer's Handbook.
The Tabulator's Handbook.
The Seaman's Handbook of Meteorology.
The Fisherman's Handbook.
Gales on the British Coasts. A revised edition of the Fishery Barometer Manual.
The Seasons in the British Isles.
Normals for the four Observatories, and tables for their application in climatology.
Atlas of Tropical Hurricanes.

The publication of the following papers, &c., may also be mentioned :—

By Mr. W. H. Dines, F.R.S.—

The statical changes of pressure and temperature in a column of air that accompany changes of pressure at the bottom. Q.J. Roy. Met. Soc., vol. 38, p. 41, 1912.

By Dr. C. Chree, F.R.S., Superintendent of Kew Observatory—

Studies in Terrestrial Magnetism. Macmillan & Co.

The Diurnal Inequality of Barometric Pressure at Castle O'er, Dumfriesshire. Q.J., Roy. Met. Soc., vol. 37, p. 325, 1911.

By Mr. R. G. K. Lempfert, Superintendent of the Forecast Division—

The Thunderstorms of July 29, 1911. Q.J. Roy. Met. Soc., vol. 38, p. 121, 1912.

By Mr. R. G. K. Lempfert and Mr. H. W. Braby—

A method of summarising anemograms. Q.J. Roy. Met. Soc., vol. 38, 1912.

By Mr. Charles Harding—

The Abnormal Summer of 1911. Q.J. Roy. Met. Soc., vol. 38, p. 1, 1912.

The reports of the work of the several Divisions of the office are as follows :—

I.—Marine Division.

Report by Campbell Hepworth, C.B., R.D., Commander, R.N.R., Superintendent.

Collection of Information.—The arrangements for the systematic collection of data, for the purposes of marine meteorology, from officers of the Royal Navy and the Mercantile Marine, have been continued as in previous years. The number of vessels entered in the Office books as equipped with meteorological instruments lent by the Office, for the purpose of keeping a meteorological log, was 181 as compared with 186 last year. In addition there are 15 steamships from which reports are received by radio-telegraphy that are provided with mercury barometers lent by this Office. Meteorological four-hourly log books, registers, and other documents, to the number of 2,791 were received during the year. A list of these is given in Appendix IV. Of the meteorological log books which contain four-hourly observations, 206 have been classed as "excellent," or "very good," as compared with 211 for the year 1910–11.

Supplementary Information.—The arrangements for obtaining meteorological registers from the captains and officers of ocean-going ships who use their own instruments have been continued, and a large amount of information has thereby been collected,

which is immediately utilised in the Monthly Meteorological Char of the North Atlantic and Mediterranean, and of the Indian Oce and Red Sea, when possible.

A series of barograms have been received from ships H.M. Navy and the Mercantile Marine which give a continuo record of pressure in various parts of the world.

The following lists show the number of contributions classifi according to the different lines of route :—

Four-hourly Logs.

Greenland ...	Whaling	3
Cable Ships ...	United Kingdom	1
	North Atlantic ...	3
North Atlantic ...	Canada	6
	United States ...	19
	Gulf of Mexico ...	24
	West Indies ...	4
Mediterranean		2
Black Sea		4
Africa, S.E. and E. Coasts		7
China. Coasting		1
East Indies ...	viâ Cape ...	16
	viâ Suez	49
China and Japan	viâ Cape ...	5
	viâ Suez	17
Australia ...	viâ Cape ...	35
	viâ Suez	40
Trans-Pacific		6
New Zealand ...	viâ Capes ...	23
	viâ Suez	3
South America ...	East Coast ...	22
	West Coast ...	6
United States, West Coast		10
Surveying ...	China Sea ...	1
	Australia ...	1
	W. C. Africa ...	4
River Thames		1

"Short" Logs.

East Indies viâ Suez		1

North Atlantic Registers (*Form No.* 121), *Indian Ocean Registers* (*Form No.* 122), *and Radio-telegraphy Registers* (*Form No.* 138).

Routes.		North Atlantic Registers. Form No. 121.	Indian Ocean Registers. Form No. 122.	Radio-telegraphy Registers. Form No. 138.
United Kingdom Coasts		2	—	—
North Atlantic...	Canada	378	—	329
	United States ...	598	—	397
	Gulf of Mexico ...	61	—	—
	West Indies ...	120	—	—
	Bermuda ...	27	—	—
Mediterranean		229	—	—
Black Sea		9	—	—
Africa ... ... S.E. and E. Coasts		5	3	—
East Indies ...	viâ Cape	3	13	—
	viâ Suez	—	169	—
	Coasting ...	—	4	—
China and Japan	viâ Cape	4	2	—
	viâ Suez	—	48	—
China. Coasting		—	15	—
Australia ...	viâ Cape	9	5	—
	viâ Suez	—	12	—
	Coasting ...	—	4	—
South America... East Coast ...		29	—	—
North America West Coast ...		1	—	—
Vancouver—Japan		—	1	—
Total		1,475	276	726

Recognition of "excellent" observers.—Appendix III. (p. 122) contains a list of the captains who, during the past year, have contributed logs classed as "excellent." Several of these observers have co-operated with the Office for many years. The names which appear in the list for the first time are as follow :—

Captain's Name.	Steamship.
Collins, P. J.	Marathon.
Gillman, L. B.	Matatua.
Haddock, R. L., Comm. R.N.R. ...	Mooltan.
Hutchison, J. S., Comm. R.N.R. ...	Waipara.
Linklater, T. B.	Marere.
McClure, W. H.	Garryvale.
Rae, J. B.	City of Calcutta.
Robin, E.	Herefordshire.

As a mark of recognition of valuable co-operation, the Director has presented various publications of the Office to observers who have returned well-kept meteorological log books.

Obituary.—The Committee have noted with regret the deaths of three of their old observers during 1911-12 :—Captain R. Inglis, Marine Superintendent, Cunard S.S. Co., in May; Captain R. J. Garrick, S.S. *Assyria*, in August; and Captain A. Mackay, F.R.G.S., S.S. *Campania*, in January, 1912.

Use of Information received.—The information collected has been used in the preparation of the monthly meteorological charts of the North Atlantic and Mediterranean, and of the Indian Ocean and Red Sea, as in previous years. The monthly chart for the Atlantic Ocean and the Mediterranean Sea has not been altered except in detail during the year. The weekly issue with daily maps on the back showing the distribution of pressure, &c., over the Atlantic Ocean, as prepared by the incorporation of the reports by radio-telegraphy from the ocean with the information received by telegraph from either side, has been continued. The scale of the monthly charts for the Indian Ocean has been reduced to make the size uniform with that of the Atlantic chart, and the area has been extended to cover the whole region from South Africa to Australia (30° E. to 125° E.), and from the Red Sea as far south as the Australian continent (30° N. to 35° S.). The distribution of the meteorological elements, pressure, and temperature of the air and sea are now shown on an inset chart as well as on the face of the chart. In order to avoid confusion the sea temperature is indicated by tints of blue colour, the isobars by red lines, and the air isotherms by black dotted lines, and the routes recommended between principal ports are shown by green lines. Information as to the frequency of fog and mist in different parts of the Atlantic has been prepared, and is now appearing in successive issues of the Atlantic charts. Information was supplied to Professor Hergesell in connexion with International Balloon ascents, data from ships over the Northern Hemisphere at 8 a.m., 6th to 11th December, 1909; and to the Director-General of Observatories, Simla, meteorological observations from the log-books of ships navigating the Indian Ocean between 6° N. and 45° S. from 20° E. to 130° E. Twelve small globes were prepared for, and exhibited at, the Coronation Exhibition, illustrating (1) the distribution of average pressure and wind; (2) of air temperature and relative humidity; (3) of sea temperature, and the flow of ocean currents. Information with respect to ice was also sent regularly to the *Shipping Gazette* during the season.

Information supplied to the Admiralty.—Climatological tables have been compiled for various places on the shores of the China Sea, the Baltic, Eastern Archipelago, South Indian Ocean Islands, the Mediterranean, and in the Yangtse Kiang; and surface currents of the Yellow Sea.

II.—Forecast and Storm Warning Division.

Report by R. G. K. Lempfert, M.A., Superintendent.

Daily Weather Report.—The arrangements for the issue of the Daily Weather Report and Forecasts, and for the preparation of information for publication in the newspapers, have remained generally the same as those which were in operation last year. The Report has been issued each day at about 12.30 p.m. The only changes to note in the form of the Report are (1) The omission of the wet-bulb reading and the inclusion in its place of the so-called barometric tendency, the amount of change of the barometer in the three hours preceding the hour of observation.

This change was introduced on May 1st, in accordance with the resolutions adopted at the meeting of the International Committee held at Berlin in the preceding September; (2) the use of a faint stipple to indicate on the synoptic chart for 6 p.m. the area within which precipitation has occurred during the 24-hour period to which the daily measurements of rainfall refer; (3) the inclusion of the duration and the extreme force of gales recorded at British coast stations; (4) the publication of information regarding "past weather" for each of the intervals 7 a.m. to 1 p.m., 1 p.m. to 6 p.m., and 6 p.m. to 7 a.m., separately, in place of a single group of letters summarising the weather for the complete 24-hour period.

Weekly Weather Report.—At the beginning of the year 1912, the form of the synoptic charts included in the Weekly Weather Report was entirely modified. In place of three maps for each day, showing respectively the distribution of pressure and wind over Europe at 7 a.m. and 6 p.m., and the distribution of temperature and weather at 7 a.m., a single map is now shown for each day. It embraces a much larger area than that included hitherto. It includes the whole of Europe, the North Atlantic Ocean north of latitude 28° N., and a portion of the North American Continent as far west as the great lakes. The maps show the distribution of pressure, wind, weather and temperature at the hour of morning observation. They are on the scale $1 : 4 \times 10^7$. The information for Europe is derived from the telegraphic reports received at the Office and from the Bulletin International issued by the Bureau Central Météorologique of Paris. The information for the Atlantic Ocean is derived from reports received by wireless telegraphy, supplemented by reports received by post. The extension of the area included in the chart affords an opportunity of rendering available the information received by wireless telegraphy. By delaying the issue of the maps for one week it is possible to include for the portion of the American Continent shown on the map the information published in the Daily Weather Reports of the Canadian Meteorological Service.

Charts for the Northern Hemisphere.—Since the beginning of the year 1912, the synoptic charts published in the Daily Weather Report of the Russian Meteorological Service, have been extended to include the Siberian as well as the European portion of the Russian Empire. Advantage has been taken of this to extend the area of the daily synoptic charts published in the weekly issues of "Monthly Meteorological Charts of the North Atlantic Ocean." It now extends eastward as far as the Pacific coast. The positions of the main areas of high and low pressure over the American Continent are also indicated, the information given in the Bulletin International of the Bureau Central Météorologique being used for the purpose.

Telegraphic Reporting Stations.—The stations from which daily telegraphic reports are received are shown in the lists given on pp. 82 to 109 and on Map (Fig. 4, p. 108).

In consequence of the retirement of the Reverend W. Brand and of Miss Jessie Sinclair, the observers at Sumburgh Head and Wick, the arrangements for observing at these two stations have

had to be modified. In both cases it has been possible to arrange with the Admiral Commanding Coastguards and Reserves for the work to be undertaken by the Coastguard. This has involved a transfer of the station at Sumburgh Head to Lerwick. Climatological observations are being continued at Sumburgh Head (Dunrossness) by the Reverend W. Fotheringham.

Daily reports of observations at 7 a.m. and at 6 p.m. have been received from Bath, Clacton-on-Sea, Dover and Newquay by the courtesy of the respective local authorities, as in previous years.

Inspection of the Stations.—The stations indicated in the list in Appendix VI., p. 143, have been inspected during the year. The reports of the inspectors show that efficiency has been maintained.

Wireless Telegrams.—During the year ended March 31st, 68 wireless telegrams were received from the ships of His Majesty's Navy; 16 of these messages reached the Office in time to be included in the issue of the Daily Weather Report for the same day. All but seven were in time to be included in one or other of the maps of the report.

In the course of the twelve months ending with March, 1911, 4,922 wireless reports were received from Atlantic liners. The numbers in the several months ranged from 497 in October to 303 in February. Particulars of the number of messages received from each ship are given on p. 136. The number of messages is greater by nearly 1,000 than the corresponding figure for the twelve months ending with March, 1911.

Only 232 out of the total of nearly 5,000 messages reached the Office in time to be included in "to-day's" map in the Daily Weather Report, *i.e.*, within about four hours of the time of taking the morning observations; 2,352 messages, or rather less than half the total, reached the Office in time to be included in one of the two maps for "yesterday" shown in the Daily Weather Report. As the forecasts are prepared within about two hours of the time of observing, it is evident that very few messages reached the Office in time to be of direct and immediate application in the preparation of forecasts or the issue of storm warnings. Nevertheless there were again a number of occasions on which the messages were of great assistance to the forecaster. They often gave the earliest observations of the westerly or north-westerly winds in the rear of a depression, and so put him in a position to forecast the early extension of these winds to our western districts. Such cases occurred on May 2nd, July 14th, July 24th, September 1st, November 28th, January 15th. On other occasions the extension of southerly winds to some distance from our western coasts increases the probability of a continuance of southerly winds over the British Isles for the whole 24-hour period covered by a forecast. Such cases occurred on December 1st, January 8th, and March 1st. Wireless reports have also proved valuable in connexion with the issue of a "further outlook," especially when it takes the form of a notification of a probable spell of fair weather. Such a notification would not be issued if wireless reports showed the existence of important disturbances over the ocean.

The number of occasions on which wireless reports conveying information which would have been useful to the forecaster came

to hand after the issue of the forecasts is unfortunately considerable. A conspicuous example occurred in connexion with the gale experienced in the night from November 29th to 30th. Wireless reports received subsequently indicated a very deep disturbance in longitude 25° W. Had this information been in the hands of the forecaster sufficiently early, storm warnings would have been issued to all Scottish coasts. As it was, a severe gale occurred for which no warnings were issued.

Reports from Auxiliary Stations.—The information as to the weather in the British Islands has been supplemented by postal and telegraphic reports sent daily from stations belonging to various local authorities. The information supplied has been included in the Daily Weather Report.

Discussion of Information.—A detailed account of the manner in which the meteorological information received by telegraph is utilised for the preparation of the Daily Weather Report is given in Appendix II., p. 63.

Weather Forecasts.—The means adopted for the distribution of the forecasts drawn up in the Office have been continued during the past year. They are detailed in Appendix II., p. 65. The forecasts have been supplemented by a "further outlook," extending the period covered by the forecasts beyond the normal 24 hours whenever the conditions were sufficiently definite to warrant it.

Forecasts for H.M. Ships.—Forecasts have been supplied regularly to the Commander-in-Chief of the Home Fleet, to the Officers in Command at Devonport, Portland, and the Nore, and to the Naval Aeronautical Department at Barrow-in-Furness. The arrangements made last year, at the request of the Lords Commissioners of the Admiralty, for the preparation daily of a forecast message to be transmitted by wireless telegraphy to such of H.M. ships as may be within range have been continued. Since March 1st such messages have been prepared twice a day.

Harvest Forecasts.—The special service of afternoon forecasts for the benefit of agriculturists and others was arranged on lines similar to those followed in previous years, and special telegraphic reports of observations at 1 p.m. were obtained for this purpose. The forecasts referred to the period from 6 a.m. to 9 p.m. of the following day, these being regarded as the usual limits of an agricultural working day. On occasions when the conditions seemed favourable the ordinary forecast was supplemented by a "further outlook," giving the probable weather for one or more days beyond the usual period.

The service covered the four months, June to September, but early in May the weather assumed an unusually settled type, which was maintained, with comparatively slight variations, for about six months. Long spells of drought, brightness and warmth were the characteristics of this remarkable period, the result being an unusually early harvest. Under such exceptionally favourable conditions there was not much inducement for farmers to ask for forecasts, and the influence of the season is, therefore, reflected in the list of subscribers.

Applications for series of harvest forecasts were received from 50 persons—34 for the special afternoon issues, while nine

preferred the morning series, and seven the evening series. Of the 50 applicants :—

1	resided in District	0.	Scotland, N.
10	„	3.	England, E.
7	„	4.	Midland Counties.
13	„	5.	England, S.E.
5	„	7.	England, N.W.
12	„	8.	England, S.W.
2	„	10.	Ireland, S.

The applicant in Scotland, N., was interested in the harvest of the sea.

Arrangements were again made for the issue of notifications of probable spells of fine weather in connexion with the harvest forecast service. The experience of previous years had shown the desirability of keeping the recipients of these notices informed of the course of events from the time of the issue of the first notification up to the definite break up of the spell. It was therefore decided to make each spell-notification consist of a series of telegrams, the minimum number being two. Seventy-four applications for spell notifications on these lines were received.

Daily records of weather were kept on forms supplied by the Office by 27 subscribers for harvest forecasts, for the purpose of checking the accuracy of the forecasts. A comparison of the forecasts issued with these records shows that of the daily forecasts 55 per cent. were correct in all particulars and 35 per cent. correct as regards more than half the elements referred to in the forecast. In England, N.W., the complete successes were 58 per cent. and in England, S.W., 60 per cent. As regards the "further outlook," 75 per cent. were entirely successful and only 14 per cent. failures. In both classes of forecasts the results were better than the corresponding ones of the previous year.

The special notifications of spells of weather were regarded as successful when the conditions were in accordance with the forecast through at least three days, and on this reckoning 74 per cent. proved correct.

Inquiries for Forecasts.—The following are the numbers of inquiries for forecasts of various kinds dealt with during the year :—Telegraphic prepaid replies 348, other inquiries answered by telegram 108, telephonic inquiries 67, personal inquiries 12. In addition regular forecasts have been telegraphed to private subscribers for varying periods. The numbers of such applicants have varied between 6 and 14.

Arising out of a suggestion put forward by "Lloyds," arrangements have been made with the Post Office for the captains of ships equipped with wireless apparatus to obtain forecasts of the weather anticipated on the British coasts by this means. Three inquiries of this nature were received during the year.

Forecasts in anticipation of special conditions have been sent on various occasions in connexion with snowfall, night frosts, or smooth sea.

Results of Forecasts.—A comparison for the year of the forecasts for the United Kingdom issued at 8.30 p.m., with the subsequent weather, is given below. The complete success, partial success, partial failure, and complete failure of the forecast as regards both

ıd weather, are estimated according to definite rules which igned to eliminate bias as far as possible.

term "partial success" is applied to cases in which more lf the details included in the forecast are justified by subse-vents. With regard to *wind* the details comprise direction ·ce, and anticipated changes in either particular. With to *weather* they comprise temperature, the state of the sky :loudy, or overcast), and the probability of rain, snow, fog, , &c., with occasional indications as to the duration or y of any or all of the phenomena mentioned. The term l failure" is applied in a similar way to a forecast in which an half the details given are incorrect.

IMARY of RESULTS of 8.30 p.m. FORECASTS in 1911.

(*a.*) *Results for the various Months.*

ıths.	Percentages.												
	Complete Success.			Partial Success.			Partial Failure.			Complete Failure.			Sum of Successes, Complete and Partial.
	Wind.	Weather.	Average.	Wind.	Weather.	Average.	Wind.	Weather.	Average.	Wind.	Weather.	Average.	
... ...	68	57	63	28	38	33	3	5	4	1	–	–	96
... ...	59	44	52	31	46	38	9	9	9	1	1	1	90
... ...	70	62	66	29	34	32	1	3	2	–	1	–	98
... ...	64	58	61	32	39	35	3	3	3	1	–	1	96
... ...	62	50	56	28	36	32	7	11	9	3	3	3	88
... ...	77	68	73	22	29	25	1	3	2	–	–	–	98
... ...	51	68	60	37	25	31	9	4	6	3	3	3	91
... ...	69	56	63	26	40	33	3	4	3	2	–	1	96
r ...	59	60	60	34	32	33	2	7	4	5	1	3	93
...	64	53	59	26	35	30	5	9	7	5	3	4	89
...	73	70	72	21	25	23	1	5	3	5	–	2	95
...	49	63	56	41	32	37	4	5	4	6	–	3	93
e Year	64	59	62	29	34	32	4	6	4	3	1	2	94

(*b.*) *Results for the various Districts.*

ricts.	Percentages.												
	Complete Success.			Partial Success.			Partial Failure.			Complete Failure.			Sum of Successes, Complete and Partial.
	Wind.	Weather.	Average.	Wind.	Weather.	Average.	Wind.	Weather.	Average.	Wind.	Weather.	Average.	
nd, N.:													
ıds ...	62	60	61	29	36	32	6	3	5	3	1	2	93
land ...	62	60	61	28	36	32	7	4	6	3	1	1	93
nd, E. ...	60	53	57	31	38	34	6	8	7	3	1	2	91
ıd, N.E.:													
hern part	63	54	59	32	40	36	3	5	4	2	1	1	95
hern part	66	54	60	30	39	34	3	6	5	1	1	1	94
ıd, E. ...	63	56	60	31	36	33	4	6	5	2	2	2	93
ıd Coun-													
:													
ern part	67	58	63	28	34	31	2	7	4	3	1	2	94
ern part	67	57	62	29	35	32	2	6	4	2	2	2	94

(*b.*) *Results for the various Districts*—continued.

Districts.	Percentages.											
	Complete Success.			Partial Success.			Partial Failure.			Complete Failure.		
	Wind.	Weather.	Average.	Wind.	Weather.	Average.	Wind.	Weather.	Average.	Wind.	Weather.	Average.
5. England, S.E....	67	54	60	28	36	32	2	9	6	3	1	2
6. Scotland, W.:												
Mainland ...	62	63	63	31	32	31	4	4	4	3	1	2
Isle of Man ...	60	59	60	32	37	34	4	3	4	4	1	2
7. England, N.W.:												
England, N.W.	65	60	63	29	32	30	3	7	5	3	1	2
North Wales	64	61	63	30	33	31	3	5	4	3	1	2
8. England, S.W.:												
South Wales...	68	59	64	25	34	29	5	5	5	2	2	2
England, S.W.	69	59	64	25	35	30	4	4	4	2	2	2
9. Ireland, N.:												
Western part	63	67	64	28	29	29	5	4	5	4	0	2
Eastern part	61	65	63	29	31	30	8	4	6	2	–	1
10. Ireland, S.:												
Eastern part	60	63	62	33	31	32	4	6	5	3	–	1
Western part	60	64	62	34	30	32	4	5	5	2	1	1
Summary ...	64	59	62	29	34	32	4	6	4	3	1	2

The following table shows the success of the forecasts o year in comparison with those of previous years. It gives for year of the decade 1902–1911 the percentages of complete partial successes of the Forecasts issued at 8.30 p.m. Unti year 1905 the annual period included was that for the 12 m ending with March. The results for 1905 to 1911, given belo for the calendar year. The percentage of complete success an sum of successes (complete and partial) were both higher th any year since 1879, when the present service of daily fore was inaugurated.

PERCENTAGES of SUCCESS in the FORECASTS for the wh of the BRITISH ISLES.

Year.	Complete Success.	Partial Success.	Sum of Successes, Complete and Partial.
1902-03 ...	53	35	88
1903-04 ...	56	30	86
1904-05 ...	57	31	88
1905	56	32	88
1906	61	30	91
1907	54	37	91
1908	58	34	92
1909	58	35	93
1910	60	33	93
1911	62	32	94
Average ...	**57·5**	**32·9**	**90·4**

A "further outlook" was appended to the forecasts for 24 hours on 173 occasions; 78 of these notifications were issued in connexion with morning forecasts, and 95 in connexion with evening forecasts; 14 referred to a change or a partial change of the type of weather; the remainder notified the probable continuance of existing conditions. 83 per cent. of the notifications were completely justified by the subsequent weather, and 8 per cent. were partially justified. 9 per cent. of the notifications proved to be incorrect.

Tables of Wind Frequency.—Tables of wind frequency have been prepared from the hourly tabulations of the anemograms for publication in Appendix III. to the Weekly Weather Report, as in previous years. Mr. H. W. Braby, B.A., who worked in the division as voluntary assistant from April until September, devoted some of his time to the preparation of wind-normals for some of the Office anemometer stations. The results are being published in the Quarterly Journal of the Royal Meteorological Society in a paper to be read on April 17th. It is proposed to prepare monthly wind roses showing the frequency for directions as well as force for selected stations for 1912, in place of the tables of force-frequency prepared hitherto for all stations.

Storm Warning Service.

Arrangements have been made with the Post Office for the introduction of a new system for the distribution of the telegrams sent out from the Office containing instructions to hoist or lower storm cones. These are now practically completed, and it is proposed to bring the new Service into operation at an early date. It is hoped that it will reduce the time required for the circulation of the messages, especially in the case of remote stations with which telegraphic communication involves the frequent re-transmission of the messages.

Concurrently with this modification of the telegraphic arrangements, the list of stations to which warnings are circulated has been revised. A slight modification has also been made in the grouping of the stations on the British coasts into districts for storm warning purposes, in order to bring into harmony the storm warning districts and the districts used for other forecasts for the sea. A complete list of places to which storm warnings are sent is given in Appendix II., p. 69. In spite of the fine summer, the number of warnings issued in 1911 was unusually large, owing to the very disturbed character of the last three months. Warnings were issued on 877 distinct occasions as compared with 820 in the previous year; an average of 63 for each district as compared with 59 in 1910 and 33 in 1909.

A comparison between the warnings issued during the year and the subsequent weather is given in the following table. Appended to the table are notes respecting the gales for which no warnings were issued, with brief statements of the circumstances in which they occurred.

Storm Warning Checking.

Comparison between the Warnings issued and the subsequent Weather in 1911.

Districts and Number of Stations.		Total No. of Issues to each District.	Issues justified by subsequent Gales. Force 8 and upwards.	Issues justified by subsequent strong Winds. Forces 6 & 7.	Issues not justified by subsequent Weather.	Issues late. Force 8 reached at two Stations before issue.	Issues partially late. Force 8 reached at one Station before issue.	Storms for which no Warning was issued.
Scotland, N.E.	31	29	12	12	4	—	1	
		41	22	13	6	—	—	Nov. 30.
„ E.	20	15	5	9	1	—	—	June 24.
		29	9	14	6	—	—	
„ N.W.	5	28	8	13	5	—	2	Feb. 26; May 7.
		36	17	8	11	—	—	Nov. 30.
„ W.	16	25	8	11	6	—	—	
		39	10	13	16	—	—	
Irish Sea ...	7	29	15	12	1	—	1	Feb. 26; Mar. 1[illegible] 8; June 24.
		40	22	11	6	—	1	
Ireland, N. ...	18	35	24	7	3	—	1	Feb. 26; Mar. [illegible] 6; May 3.
		42	31	9	1	1	—	Dec. 13.
„ S. ...	29	34	20	9	3	1	1	Feb. 26; May 3[illegible] 3; June 24.
		41	30	8	2	—	1	
St. George's Channel	1	25	15	6	4	—	—	Feb. 26; Mar. 6.
		36	25	9	1	1	—	Nov. 23–24; Dec. 1[illegible] 13.
Bristol Channel	23	30	24	6	—	—	—	Feb. 26; Mar. 6.
		38	31	5	1	—	1	Sept. 30; Nov. 23-2[illegible] –24.
England, S.W.	21	28	22	6	—	—	—	
		39	26	8	2	1	2	Dec. 13.
„ S.	17	26	15	8	3	—	—	
		38	22	12	3	1	—	Dec. 21.
„ S.E.	14	26	10	10	5	—	1	Feb. 26.
		33	20	8	4	1	—	Sept. 30; Nov. 23-2[illegible] –24; Dec. 20.
„ N.E.	12	19	11	2	5	1	—	Jan. 2; Feb. 2[illegible] 26; Mar. 14; Mar. [illegible] 25.
		28	13	10	4	1	—	Sept. 30.
„ E.	16	23	7	11	4	1	—	Jan. 2; Feb. 2[illegible] 26; Mar. 14.
		25	13	11	1	—	—	Sept. 30.
Average per District...		27	14	9	3	0·2	0·5	
		36	21	10	5	0·4	0·4	
Percentages		—	52·7	32·8	11·8	0·8	1·9	
		—	57·6	27·5	12·7	1·2	1·0	
For whole year: Average per District...		63	35	19	8	0·6	0·9	
For whole year: Percentages		—	55·5	29·8	12·3	1·0	1·4	

Note.—In order to facilitate comparison with the statistical tables of t[illegible]he Board of Trade which are made up for the year ending June 30, the figures f[illegible]for the two halves of the year 1911—January 1 to June 30, and July 1 to Decem[illegible]m-ber 31—are given separately for each district. The upper line of figures in ea[illegible]ch case gives the particulars for the first half of the year.

GALES EXPERIENCED in 1911 WITHOUT WARNING.

nuary 2nd. England, N.E., and *E.*, and part of *Irish Sea.*

A depression situated over Scandinavia on morning of January 1st moved on a track slightly West of South, instead of South-Eastward, as expected, and became deeper in the process.

ebruary 26th. Scotland, N.W., Irish Sea, Ireland, S., Ireland, N., St. George's Channel, Bristol Channel, England, S.E., England, N.E., England, E.

Warnings expired on evening of February 25th, and the signals were not kept up. A further development of a secondary depression over the North Sea, and the northerly extension of the high pressure over the Bay, gave rise to North-Westerly gales over the British Isles during the morning of February 26th.

larch 6th. Ireland, N., St. George's Channel, Bristol Channel.

A Northerly gale developed in the rear of a "V" shaped depression which passed rapidly over the country during the night of March 5*th*–6*th*.

larch 14th. England, N.E., and *England, E.*

A depression which had passed eastward along the Channel became stationary during the night of the 13th–14th, and as the barometer continued to rise in the West, a severe Northerly gale developed on the East Coast early on 14th. No warnings were issued to these districts on the 13th, as it was anticipated that the depression would continue to move eastward.

larch 18th. Irish Sea.

An Easterly gale caused by a depression in the south-west spread rather further northward than was anticipated.

larch 25th. England N.E.

A North-Easterly gale spread rather further northward than was anticipated.

lay 3rd. Ireland, S., and *Ireland, N.*

An Atlantic depression, of which there was no indication on the evening map for May 2nd, caused a South-Westerly gale on the Irish coasts early on May 3rd.

lay 7th. Scotland, N.W.

A South-Easterly gale, of limited extent, during the night of May 7th–8th. No warnings could be issued as telegraph offices in this district are not open on Sunday evenings. There were no indications of the approach of the gale on the morning of the 7th.

une 24th. Scotland E., Ireland, S., Irish Sea.

A depression from the east of England moved northward and developed more strongly than was anticipated.

eptember, 30th. Bristol Channel, England, S.E., England, N.E., England, E.

A shallow disturbance off the north-west of Scotland on the evening of the 29th moved rapidly south-eastward and became much deeper. Warnings were issued to the western districts only. On the morning of September 30th the depression was centred on the Humber. It continued to grow much deeper as it passed away to Holland. Severe Northerly gales resulted on our

east coast, for which no warnings were issued. Even on the morning of the 30th there was no reason to anticipate the great increase in depth of the depression.

November, 23rd–24th. St. George's Channel, Bristol Channel England, S.E.

A depression, shown over Spain on the evening of 22nd moved northward rather unexpectedly during the night, and caused North-Easterly gales on the east of the Channel early on the 23rd. The gale subsequently extended to the Bristol and St. George's Channels, to which no warnings were issued.

November, 30th. Scotland, N.E., Scotland, N.W.

Warnings were issued to Ireland and the south-west of England on the afternoon of November 29th, but there were no indications in the evening that the Scottish districts were threatened. Wireless reports received subsequently revealed a very deep depression centred in Latitude 50° N., Longitude 25° W. The steep gradient of this depression caused a severe gale on the Scottish coasts early in the morning of November 30th. The warnings issued at 8.30 a.m. were thus too late.

December, 13th. Ireland, N., St. George's Channel, England, S.W

A depression appeared unexpectedly over the mouth of the Channel on the morning of December 13th. Warnings were immediately issued, but they were too late in these districts.

December, 20th. England, S.E.

A rapidly moving "V" shaped depression, shown on the morning map of December 20th, did not appear sufficiently intense to justify the issue of warnings. The North-Westerly wind in its rear reached gale force in the east of the English Channel.

December 21st. England, S.

A depression developed unexpectedly in the south-west during the night of December 20th. The warnings issued on the morning of the 21st were too late in the English Channel.

Comparison of results for 1911 with previous years.—The following table contains a statement of the amount of success of storm warnings in each year, and the average, for the decade 1902-1911 :—

Years.	Average No. of Warnings per District.	Warnings justified by subsequent Gales.	Warnings justified by subsequent strong Winds.	Total Warnings justified.	Warnings not followed by increase of Wind.
		p.c.	p.c.	p.c.	p.c.
1902	38	55·5	32·0	87·5	9·0
1903	54	62·6	27·3	89·9	7·3
1904	39	59·4	30·4	89·8	6·7
1905	45	52·5	35·9	88·4	9·5
1906	53	54·7	33·3	88·0	8·5
1907	41	55·2	37·0	92·2	5·9
1908	45	53·4	32·3	85·7	10·7
1909	33	48·9	36·9	85·8	8·5
1910*	59	51·1	35·5	86·6	11·0
1911*	63	55·5	29·8	85·3	12·3
1902–11 ...	47	54·9	33·0	87·9	8·9

* Beginning from 1910 the period covered by a warning was reduced from 48 hours to 36 hours or less, according to the time of issue. A second warning is issued if the storm condition is maintained.

Averages.—The corresponding figures, giving the average results for the four preceding decades, are as follows :—

Period.	Average Annual No. of Warnings per District.	Warnings justified by subsequent Gales.	Warnings justified by subsequent strong Winds.	Total Warnings justified.	Warnings not followed by increase of Wind.
		p.c.	p.c.	p.c.	p.c.
1871–80 ...	40	51·9	25·7	77·6	16·8
1881–90 ...	52	57·3	25·1	82·4	15·5
1891–1900 ...	37	62·7	27·5	90·2	5·8
1901–10 ...	44	55·6	32·7	88·2	8·5

III.—Statistics and Library Division.

Report by E. Gold, M.A., Superintendent.

Climatology of the British Isles.

Distribution of Stations.—A list of stations in connexion with the Office, in which particulars are given of the orders of the stations and of the Official publications for which the returns have been prepared, will be found in Appendix II. on pp. 82 to 107.

The names of stations which have been added to the list in the course of the year are printed in clarendon type.

The distribution of these stations in the various districts may be summarised as follows :—

—	Observatories.	Normal Climatological.	Auxiliary Climatological.	Telegraphic Reporting.	Sunshine (including Observatories).	Additional Rainfall.	Additional Anemograph.	Additional Barograph.
0. Scotland, N.	0	8	2	5	7	4	1	7
1. „ E.	1	6	7	3	10	2	1	4
2. England, N.E.	0	9	11	2	14	8	1	3
3. „ E.	0	8	10	2	13	14	3	3
4. „ Midlands ...	0	13	28	3	22	21	2	5
5. „ S.E.	0	8	34	2	31	18	3	4
London District ...	1	4	9	1	9	8	1	2
6. Scotland, W., and Isle Man.	2	7	4	0	8	3	0	2
7. England, N.W., and N. Wales.	1	13	20	2	22	6	5	4
8. England, S.W., and S. Wales.	1	5	28	3	26	24	2	1
9. Ireland, N.	0	4	2	3	2	6	1	4
10. „ S.	1	8	9	3	8	8	4	4
11. Western Channel ...	0	1	1	2	4	0	1	1
Total	7	94	165	31*	176	122	25	44

* Of these, 14 observe at 7 a.m., 1 p.m., and 9 p.m., and thus come under the international definition of a station of the second order. These stations have not been included in the 94 normal climatological stations. Aberdeen, Kew, and Valencia are given under Observatories and under Telegraphic Reporting Stations.

Records have also been received from 5 additional thermograph stations, 10 additional autographic raingauge stations, 1 hygrograph station, 60 sea temperature stations. Daily reports are received by telegraph from 46 foreign stations (*see* p. 108).

Observatories are also maintained at Greenwich (The Roya Observatory), Oxford (Radcliffe Observatory), Bidston (Mersey Docks and Harbour Board), Southport (the Corporation), and Berkhamsted (E. Mawley, Esq.), and from these, records for occasions of special interest have been courteously supplied when asked for.

Normal Meteorological Observatories, Anemograph and Sunshine Stations.

Observatories.—The work of the three normal observatories of the office is reported upon separately, pp. 45 to 53.

The work of the normal observatories at Aberdeen and Falmouth has been carried on as usual. At Aberdeen theodolite observations of pilot balloons are made regularly to determine the velocity and direction of the upper wind currents, and, if possible, to furnish information as to the vertical currents of the atmosphere.

In connexion with the publication of the records from the observatories in absolute units it has been necessary to convert the tabulated values from degrees Fahrenheit, inches of mercury and miles per hour into degrees absolute, millibars and metres per second. Tables are in course of preparation for the direct conversion of the original measurements into absolute units. Those for wind velocity have already been issued to the observatories and those for pressure are nearly completed. Before direct tabulation of the dry and wet bulb thermograms in degrees absolute can be undertaken, it will be necessary to prepare hygrometric tables in the new units.

Anemograph Stations.—The number of anemograph stations which are maintained by the Office, or from which records are regularly received at the Office, is now 29. The autograph records are tabulated week by week, so that the information they contain may become available for public use without delay. Information from four of them is published monthly in the Geophysical Journal (British Meteorological Year Book, Part III. (2)), and an annual summary of gales is published as an appendix to the Weekly Report (Year Book, Part I.).

From the beginning of January, 1912, the anemograms from instruments belonging to the Office have been summarised under the general headings gales, strong winds, fresh or moderate breezes and light winds or calms, with special notes of exceptional gusts, the range of variation and the character of the curve. For these stations hourly tabulations are no longer made. The hourly tabulations are continued for certain additional stations for which the curves are returned to the observers after tabulation.

Records of Sunshine.—The number of stations from which returns of "bright" sunshine are received continues to increase, and at the close of the year amounted to 179, or 23 more than last year. With three exceptions they are all situated in the British Isles, the exceptions being Georgetown, British Guiana; the Falkland Islands; and Chin-kiang, China. The original records from 122 stations are retained in the Office, whilst those from the remainder are sent to the Office monthly for examination and are then returned.

Changes in Stations.—The normal climatological station at Birr Castle, which contributed data to the annual volumes of "Observations at stations of the second order" from 1873 to March, 1911, has discontinued the observations at 9 a.m. and 9 p.m. Its place in the volume of "Daily Readings at Stations of the First and Second Orders" has been taken by Mungret College, Limerick. The observations at Braemar have been recommenced, and the results are contributed to the Monthly Weather Report through the Scottish Meteorological Society.

Among the stations which have been started or have come into connexion with the Office during the year, must be mentioned normal climatological stations at Newtownforbes, co. Longford, and Donabate, co. Dublin. The following auxiliary climatological stations have been added to the list: Kettins, Carnoustie, West Witton, Hemel Hempstead, Hampstead (Redington Road), Lisburn, Wexford.

The following observers, who had hitherto contributed returns to the Royal Meteorological Society, have sent records of their observations to the Office since January 1, 1912. Summaries of the observations from the stations marked with an asterisk had been contributed by the Society in previous years for publication in the Monthly Weather Report :—

R. Shafto Adair, Minehead ; E. T. Adams, Halstead ; E. Heron Allen, Selsey Bill ; Sir R. A. Allison, D.L., J.P., Scaleby ; J. S. Amery, Ashburton ; F. C. Bayard, LL.M., Wallington ; Capt. C. Morrison Bell, Bellingham ; *Sir Hugh L. Bell, Bart, J.P., Rounton ; G. Berry, Princetown ; C. E. de Bertodano, Malmesbury ; C. L. Brook, Meltham ; G. F. Carter, Borough Engineer, Croydon ; W. J. Carter, New Malden ; Capt. H. Ashton Case, Beckford Hall ; *Miss Chichester, Woolacombe ; J. Dale, Macclesfield ; J. W. Duncan, Golder's Green ; T. L. K. Edge, M.A., Strelley ; *C. W. Edwards, Lowestoft ; S. M. Egar, Eye, Peterborough ; *Rev. F. Ehlvers, Shaftesbury ; J. D. Evans, Matlock ; T. L. Evans, M.R.C.S., Midhurst ; *Rev. W. L. W. Eyre, M.A., Swarraton ; H. Nowell ffarrington, Leyland ; *Rev. H. E. B. Ffolkes, M.A., Hillington ; *M. T. Foster, Cullompton ; *F. H. French, Worthing ; Rev. C. Gelderd, Ushaw, Durham ; *G. Hamlin, Brighton ; *C. D. Hanan, M.B., Newcastle, Co. Wicklow ; J. Hunter, Belper, Quarry Bank ; A. P. Jenkin, Redruth ; *E. W. Rees Jones, M.D., Blackpool ; *John Knight, M.D., Scarborough ; *G. H. Lee, Raunds ; A. Lockwood, Llanberis ; Mrs. C. Lyndon, Grayshott ; *Rev. J. C. Maddock, O.S.B., Hereford ; A. Mander, Malvern ; *E. Mawley, Berkhamsted ; W. J. Monk, Tavistock ; *H. Mellish, J.P., D.L., Hodsock, Worksop ; *T. Midgley, Bolton ; J. W. Nowell, Wellington ; *Miss F. E. A. P. Parker, and Miss A. H. T. P. Parker, Bennington ; *The Hon. Lady Peek, Rousdon ; Mrs. A. Pepper, Seathwaite ; E. N. Plevins, Thrapston ; *A. W. Preston, Eaton, Norwich ; O. M. Prowse, Ilfracombe ; Miss Radford, Sidmouth ; A. Roebuck, Caistor ; E. W. Routley, M.D., M.R.C.P., Aldershot ; J. A. Saner,

Northwich; *A. C. Saxby, Cheltenham; J. W. Sherwin, Egremont; G. C. H. Simmonds, Brookwood, Woking; *F. G. Smart, M.B., Tunbridge Wells; S. C. Smith, Clerk to U.D.C., Weston-super-Mare; H. Southall, J.P., Ross, Hereford; H. D. Strange, Dorchester; *A. Thomas, M.D., Aberystwyth; J. C. Thresh, D.Sc., Chelmsford; W. P. Warren, Enfield; W. E. Whitehouse, Welshpool; J. H. Willis, Southwell, Norwich; *R. H. Wilshaw, M.B., Worthing.

The normal climatological and anemograph station previously maintained by Mr. W. E. Sotheby at Llaneugrad has been transferred to Dwyran since July, 1911.

Obituary.—The Committee record with regret the death of the following observers:—

Dr. Henry Cullinan, who had recently established a station at Portrane Asylum, Donabate. The observations are being continued by the authorities of the Asylum.

Rev. H. E. B. Ffolkes, of Hillington.

General Sir Mildmay Willson, of Rauceby Hall. The observations are being continued by his brother, Rev. V. B. Willson.

Rev. S. Lewin, of Tealby.

Inspections.—A list of stations inspected during the year by representatives of the Office is given in Appendix VI., p. 143.

Publications.—The statistical publications of the Office have been grouped together under the general title "The British Meteorological and Magnetical Year Book."

Part I., the Weekly Weather Report, has been issued with three appendices in the same form as in the previous year. A special supplement has been prepared which includes summaries of the year's observations in the upper air for Pyrton Hill, Ditcham Park, Brighton and Manchester, and the observations of Sea Temperature for all the stations for which weekly values are published.

From the beginning of January, 1912, the temperatures on the grass and in the ground, which had previously been given in a separate table, were included with the other data in the principal table of results. Averages of the temperature in the ground for each week were computed from the results already published during the five years 1907–1911, and columns giving the difference of the weekly values from the averages were also included.

The observations of sea temperatures continued to be published in a separate table, but averages for the five years 1907–1911 were computed and the differences of the weekly values from the averages are now included in the table.

The values for the duration of bright sunshine which had previously been expressed as the total duration for the week are now given as the mean daily duration during the week.

Part II., the Monthly Weather Report. Since January, 1912, the form of the report has been changed, and the data published in it considerably increased. The changes in Table A are, briefly :—

(1.) The introduction of a column for the actual hours of observation at each station, which renders unnecessary the variations of type which were used in previous years to indicate differences in this respect.

(2.) The omission of the column containing the correction for diurnal range to be applied to the mean pressures. A column containing the mean pressures at Sea level, *corrected* for diurnal range, has been substituted. The values at Station level corresponding with the hours given in the column "Hours of Observation" are also included.

(3.) For the duration of bright sunshine a similar change to that mentioned in connexion with the Weekly Report was made in the Monthly Report, the mean daily values being substituted for the monthly totals.

(4.) Under "Weather" a column giving the number of days on which the rainfall was 0·04 in. (1 mm.) or more has been added.

In Table B. the columns giving the number of days of rainfall and of ground frost have been put, with additional columns for snow, hail, thunderstorms, and fog, under the general heading "Weather." In this way a considerable increase in the publication of summaries of the information contributed to the Office has been achieved without increasing the size of the report.

The values for the different districts which were previously included in Table A. have been collected together into a single table, and values for earth temperature and for extremes of pressure have been added to the table.

The addition of the stations which had previously contributed to the Royal Meteorological Society alone rendered necessary a considerable increase in Table B. This was obtained by utilizing the last page of the Report, which had hitherto been blank, for the table of district values and the notes on the tables, thus setting free the space previously devoted to notes for an extension of Table B. Results from about 50 additional stations were included in the Report.

It ought to be mentioned here that the work of the Department was increased not only by the work of reducing the observations from these additional stations, but also by the work of reduction for nine stations in Table A. and nine stations in Table B. previously done by the Society, as well as by the necessary correspondence and queries regarding the observations.

The rainfall maps have been supplied as in previous years by the Director of the British Rainfall Organization. They are constructed from data from nearly 1,000 stations, and form a most important feature of the Reports.

Part III. (1) "Daily Readings at Meteorological Stations of the First and Second Orders" has been issued regularly about six weeks after the end of each month. It contains daily observations at 16 Climatological Stations. From the beginning of 1912 the results have been expressed in absolute units, and, in consequence of the

questions which arose in the course of preparation and the extra work in connexion with Part II., the publication is less nearly up to date than previously. At present, however, the copy for March is in proof, and that for April sent to the printers. (2) "Geophysical Journal" has been issued with less promptitude, but all the monthly parts for 1911 are now completed. It contains daily meteorological, magnetic, electrical, solar and seismic data for Kew and Eskdalemuir, meteorological and magnetic data for Valencia and values of the wind components for four hours each day for Deerness, Holyhead, Scilly and Yarmouth.

Part IV. (1) Hourly Values. Meteorological Section. The preparation for publication of the hourly values of the meteorological elements at the normal observatories in connexion with the Office was transferred to Division III. from the beginning of 1912. From the beginning of 1911 the values were published in absolute units and the observations were published in extenso only for Kew, Valencia, and Eskdalemuir. Owing to the increased work in connexion with the necessary conversion from the units in which the results were tabulated the publication was delayed considerably. At present the monthly issues for 1911 have been completed, and the monthly summaries for the three observatories mentioned, and for Falmouth and Aberdeen, are in course of preparation.

Returns for Registrars-General.—Weekly and quarterly summaries have been prepared regularly for the Registrars-General of Births, Deaths and Marriages for England and Wales and for Ireland.

As the quarterly summaries supplied to the Registrars-General are compiled from the statistical tables in the Monthly Weather Report, the changes in the latter affected the preparation of the summaries. In the course of correspondence on this subject with the Registrar-General of Births, Deaths and Marriages for England and Wales, the Office raised the question of the necessity for continuing the separate publication in the Registrar's Returns of data already included in the Monthly Weather Report, and it was eventually arranged to discontinue the extended summaries as from the end of 1911. The Office continues to supply weekly returns and a quarterly return of rainfall with general remarks upon the weather of the quarter.

The Registrar-General for Ireland expressed a desire to incorporate the changes in the Monthly Weather Report in the summaries supplied to him, and the preparation of these still forms part of the work of the Department.

Seasons in the British Isles.—Further progress has been made with the preparation of the Report on the Seasons in the British Isles, referred to on p. 35 of the report for last year, but it has been impossible to complete the work.

Information based upon the weekly values of rainfall, temperature, and sunshine for the past 30 years has been sent regularly to the different agricultural shows at the request of the Board of Agriculture. The information has included a note of the weather of the week preceding the date of the show in the current year, and an indication of the statistical connexion between the weather of the corresponding week and of the following week during preceding years.

An exhibit of climatological statistics was prepared for the Coronation Exhibition.

Climatology. Foreign and Colonial Stations.

A list of Foreign and Colonial Stations from which documents have been received in the course of the year is given in Appendix II., p. 111.

Among the additions to the list during the year under review may be mentioned stations started in Uganda at Bombo and Gulu.

The returns received from 15 stations have been examined and summarised month by month.

The copies of meteorological returns reprinted from Colonial Government publications and sent to the Office for distribution have been issued for the year 1909. The reprints for the year 1910 have not yet been received from all the Colonies.

Inquiries.

The inquiries dealt with in the Statistics and Library Division during the year were 887, of which 457 were by letter and the rest personal inquiries. The following table gives a classification of the inquiries with the corresponding figures for previous years :—

—	For Scientific or Commercial Purposes.	For Evidence in Legal Proceedings.	For Forecasts of Weather.	From Newspaper Correspondents for Special Information.	Miscellaneous.	Answered by Letter.	Answered Personally.
1903-4 ...	258	94	158	217	65	166	626
1904-5 ...	259	116	89	221	70	136	619
1905-6 ...	293	99	77	206	84	160	599
1906-7 ...	427	73	79	166	24	247	522
1907-8 ...	503	83	108	175	24	305	588
1908-9 ...	540	99	83	99	87	301	607
1909-10 ...	469	98	104	112	39	305	517
1910-11 ...	516	107	76	115	62	351	525
1911-12 ...	582	129	30	113	33	457	430

The inquiries included in the table under the heading "for forecasts of weather" are personal inquiries for information supplementary to that contained in the official forecasts and exhibited at the entrance to the Office and in St. James's Park.

Exchange of Publications.

Exchanges of publications, principally geophysical, have been arranged with the following :—

Geophysikalisches Institut der Universität, Göttingen; Hauptstation für Erdbebenforschung, Hamburg; Russian Seismological Station, Pulkova; Observatorio Meteorologico, Morelia, Mexico; Hadley Climatological Laboratory of the University of New Mexico, Albuquerque; University of California, Berkeley; Blue Hill Observatory, Cambridge, Mass.; Observatoire de Ksara (Libau); Academia Polytechnica, Oporto; Observatorio Meteorologico, Cartuja, Granada;

Oficina Meteorologica Argentina, Seccion Cordoba; Observatorio Astronomico Nacional, Tacubaya; Observatorio Meteorologico, Leon, Mexico.

Library.

The Author Card Catalogue has been kept up to date. The index numbers corresponding with the classification adopted in the International Catalogue of Scientific Literature are entered on the cards so that the subject-catalogue can be prepared directly from them.

The subject card catalogue for the books added to the library since the last list of additions was printed *in extenso*, as an appendix to the Report of the Meteorological Council for the year 1904–5, has been completed up to the end of 1910. The additions to the library received during the past year include about 600 books and pamphlets. The total number of books in the library is now about 22,600.

In Appendix VII., p. 145, will be found (1) a list of persons and institutions from whom publications containing meteorological data have been received during the last nine years with a brief indication of the nature of the information given; (2) a list of periodicals containing memoirs on meteorological subjects, which are received by the Office.

Among the most important additions to the library during the past year may be mentioned:—

Charts of the atmosphere for aeronauts and aviators, by A. L. Rotch and A. H. Palmer; Der Kompass. I., von A. Schück; Forecasting weather, by W. N. Shaw; Smithsonian physical tables, 5th, rev. ed.; Results of meteorological observations at the Radcliffe Observatory, Oxford, 1900–1905; Campagne Arctique de 1907 par le Duc d'Orléans; Die Helligkeit des klaren Himmels, hrsg. von H. Wiener, O. Wiener and W. Mobius; The Climate of the Continent of Africa, by A. Knox; Internationaler meteorologischer Kodex, 2. Aufl.; Atlas international des nuages, 2nd éd.; Scientific results of a journey in Central Asia, 1899–1902, by Dr. Sven Hedin; Dynamic meteorology and hydrography, by V. Bjerknes et alii; Rainfall of the Bombay Presidency for the years previous to 1891; Rainfall of India 1910; Atlas météorologique, 1910, par G. Eiffel; Deutsche Südpolar-Expedition, 1901–1903, 1. Teil.

Among those acquired by purchase have been:—

Tägliche synoptische Wetterkarten für den nördatlantischen Ozean, 1904–5; La sismologie moderne, par le Comte de Montessus de Ballore; The tides and kindred phenomena in the solar system, by Sir G. H. Darwin; Mathematical and physical papers, vol. 5, by Sir Wm. Thomson, Baron Kelvin; Étude sur les phénomènes périodiques de la végétation dans leur rapports avec les variations climatiques, par E. Vanderlinden; Contribution à l'étude des relations existant entre les circulations atmosphériques, l'électricité atmosphérique et le magnétisme terrestre, par A. Vialay; The sugar industry of Mauritius: a study in correlation, by A. Walter Thermodynamik der Atmosphäre, von A. Wegener; Th[illegible] physics of earthquake phenomena, by C. G. Knott; L'auro[illegible]

boréale, par H. de Kerillis; Weather science, by F. W. Henkel; Handbuch der Klimatologie, Band 3, von J. von Hann; Das Gewitter, 2. Aufl., von A. Gockel; The influence of strong, prevalent, rain-bearing winds on the prevalence of phthisis, by W. Gordon; and a selection of the volumes of the International Catalogue of Scientific Literature.

The library is available for the use of students and others between the hours of 10 a.m. and 4 p.m. A number of persons have availed themselves of this accommodation.

IV.—Instruments Division.

Supply of Instruments.

Supply to the Navy.—The number of instruments supplied to ships of the Royal Navy during the year was 1,024, as compared with 1,047 last year.

The Mercantile Marine.—To the Mercantile Marine 547 instruments were issued during the year, a decrease of 129 compared with the number supplied in the previous year. 148 thermometers, 62 hydrometers, and 5 screens have been written off the books as broken, lost, or irrecoverable.

The Australasian Antarctic Expedition.—A set of marine instruments and a special sunshine recorder with cards were lent to Dr. Mawson, of the S.S. "Aurora." Three additional marine barometers and a Besson nephoscope were supplied, on repayment, to the Committee of the Expedition.

Sets of instruments, charts and diagrams have been lent for exhibition at the Coronation Exhibition, London, and at the conversazione of the Cardiff Naturalist Society, and of the Birmingham and Midland Institute.

Colonial Governments.—The number of instruments of all kinds supplied on repayment through the Crown Agents for the Colonies, or direct to Colonial Governments, amounted to 1,233 as compared with 1,465 in the preceding year, whilst charts for recording instruments, registers, and other books amounted to 17,034, as compared with 7,352.

Requisitions from the following Colonies were complied with :—

The Commonwealth of Australia (7), Union of S. Africa (6), Fiji (2), Hong Kong, Gibraltar, Federated Malay States (6), Mauritius, Falkland Islands, Bahamas, Gold Coast, Uganda (2), Barbados, Trinidad, South Nigeria (4), East Africa Protectorate (2), Malta, Sierra Leone (3), Cyprus (3), Basutoland, British Guiana.

Local Authorities and Institutions.—Among those to whom instruments were supplied on repayment were included :—

Carnoustie Borough Council; Clacton District Council; Department of Agriculture, Barbados; Superintendent of Experiments, Shoeburyness; Department of Agriculture, Leeds; H.M. War Office; Dover Corporation; Newquay District Council; H.M. Dockyard, Rosyth (Works Dept.); Chopwellwood College; Aspatria College; Ilfracombe Urban District Council.

Private Observers.—Instruments have also been supplied on repayment to a number of private stations in connexion with the Office, viz. :—Station Hotel, Aviemore ; J. H. Scott, Esq., Wantage ; Gordon Castle, Fochabers ; Dr. Henry Cullinan, Donabate ; E. Kitchener, Esq.. Hemel Hempstead ; Rev. J. S. Begg, West Linton ; Rev. M. J. Healy, B.Sc., Waterford ; J. Sherwin, Esq., Cumberland ; the Earl of Granard, Castle Forbes, Ireland ; W. W. Holdgate, Esq., Sutton Valence.

Telegraphic Reporting Stations.—The instrumental equipment of the telegraphic reporting stations has been maintained.

Storm Cones.—Storm warning cones have been replaced at 30 stations.

Fishery Barometers.—Inspectors of the Fishery Board for Scotland, the Department of Agriculture and Technical Instruction for Ireland, and of the Board of Agriculture and Fisheries in England and Wales have continued to examine and report upon the barometers supplied for the use of fishermen in their respective districts. The stations supplied with these barometers now number 225, of which 64 are in England, 6 in Wales, 60 in Ireland, 90 in Scotland, 4 in the Isle of Man, and 1 in Jersey. The fishery barometer at Port Guarra, Cornwall, has been withdrawn.

Instruments in use at the Office.—In addition to the climatological stations which have been maintained on the roof of the Office and in the grounds of the Natural History Museum, the latter by kind permission of the Trustees of the British Museum, the following instruments have been in regular operation at the Office :—

Daily Records :—

- Pressure Tube Anemometer.
- Halliwell Recording Rain Gauge.
- Campbell-Stokes Sunshine Recorder.
- Callendar's Radiation Recorder.
- Callendar's Electrical Thermograph.
- Dines Mercurial Barograph.
- Micro-barograph.

A wind direction recorder is in process of erection, and also a Robinson anemograph with electrical registration, according to the designs of Mr. H. R. Kempe of the Engineer's Department of the Post Office.

Weekly Records :—

- Three barographs.
- Thermograph.

The routine observations and the work of changing the charts of the recording instruments have been undertaken by the junior members of the staff who constitute the corps of observers.

THE OBSERVATORIES.

Meetings of the Gassiot Committee were held on May 31, 1911, for the consideration of the Report and Accounts for the year ended 31st March, 1911, and on 25th October for the consideration of the programme and estimates for 1912–13.

The Committee regret to record the death at Kew Observatory of W. R. Corrin, son of the resident caretaker, a member of the staff of the National Physical Laboratory employed there. Plans have been approved for the remodelling of the interior of the building as soon as the work of testing instruments now carried on at the Observatory is removed to Teddington. The necessary buildings have already been commenced at Teddington, and it is expected that the transfer will be effected this year.

At Eskdalemuir some further operations have been undertaken by H.M. Office of Works for keeping the water out of the resident quarters during driving rain. Some alterations in the Superintendent's house have been carried out at the expense of the Committee, and a window suitable for observing the pole star has been inserted in the roof of the eastern magnetic hut.

An instrument designed by Prince Boris Galitzin for recording the vertical movements of the earth has been presented to the Observatory by Dr. Schuster, for which the Committee desire to express their thanks. Dr. Schuster had previously presented instruments of Prince Galitzin's design for recording the horizontal components, so that all three components are now regularly recorded at the Observatory.

Piers have been provided in the Laboratory for the installation of the two seismographs of the Omori and Wiechert types, for which smoked paper is used. The moving parts of these can be watched during the progress of a seismic disturbance.

Reports on the work of the several observatories are given below:—

V.—Central Observatory—Kew Observatory, Richmond, Surrey.

Report on the work of the Observatory.

Drawn up by C. Chree, Sc.D., LL.D., F.R.S., Superintendent, Assistant-Director of Observatories.

Buildings.—Preparations are in progress for the removal to Teddington of the work of testing instruments which has been carried on as heretofore at the Observatory for the National Physical Laboratory. The work thus done up to the end of December, 1911, is described in the Report of the Laboratory for that year.

Staff.—The staff employed has continued as last year, with the addition of Mr. Gordon Dobson, B.A., Research Student of Gonville and Caius College, Cambridge, who joined the Observatory staff in October, 1911 as Graduate Assistant for Advanced Study and Research in Atmospheric Electricity.

Self-recording Instruments and Eye Observations.—The magnetographs for the continuous record of declination, horizontal force and

vertical force, have been maintained in regular operation. Continuous records have been obtained of the meteorological elements barometric pressure, temperature of the dry bulb and wet bulb direction and velocity of the wind (by the Robinson cup standard anemograph and the Dines pressure tube), rainfall (by the Beckley gauge) and bright sunshine (by the Campbell-Stokes recorder). The Kelvin water-dropping electrograph, recording the electric potential in the atmosphere, and the Milne seismograph, recording variations of level in the east-west direction, have also been maintained in continuous operation.

The continuous records have been supplemented by the usual eye readings and observations required to determine the scale values and the base line values of the curves.

All the meteorological records obtained—except those from the pressure-tube anemometer, which have been measured at the office—have been tabulated for each hour at the observatory. The electrograms have been measured at four fixed hours every day, and at each hour on ten days a month selected as representative of quiet conditions. Every day of the year has had its electrical character assigned on an arbitrary scale. The declination and horizontal force magnetograms have been measured at each hour on the five quiet days of each month selected by Professor van Everdingen, of the Royal Netherlands Meteorological Institute, at de Bilt, in pursuance of international agreement. The maximum and minimum values of these two magnetic elements have also been measured for each day, and the times of their occurrence have been determined. The magnetic character of each day on the international scale has also been assigned. The magnetographs were run at the higher speed—twelve times the normal—during the term hours arranged for the National Antarctic and the Australasian Antarctic Expeditions. The seismograms have been studied and measurements made of the times and amplitudes of the principal movements. Regular cloud observations have been made with the Fineman nephoscope and contributed to the international scheme of investigation of the upper air for publication at Strassburg. On days of bright sunshine observations of the intensity of the solar radiation have been made with the Ångström pyrheliometer, within half an hour of noon.

A considerable number of observations of the air-earth vertical electrical current have been made with the Wilson apparatus, and a similar number of observations of the number and mobility of the positive and negative electric ions (of higher mobility) have been taken with the aspiration apparatus of Ebert. These electrical observations have been taken as a rule on fine afternoons between 2 and 4 p.m.

In addition to the work represented by the tables of results published in the British Meteorological and Magnetic Year Book the following experimental work has been conducted at the Observatory :—

Fog and Mist.—The observations of a series of distant objects have been continued as in previous years. The table summarising previous results, referred to in last year's Report, has been concluded.

Comparison of Marine Barometers.—A careful comparison was carried out between two marine barometers in which the contraction of the tube is different, from which conclusions were drawn as to the difference between the "lag" in these two barometers when used under the ordinary conditions of a land station. The barometers have since, by the kindness of Captain Main, of the "S.S. Hesperian," been read regularly during several voyages across the Atlantic, with a view to ascertaining their relative behaviour at sea. The results obtained are now under consideration.

Sudden Commencements of Magnetic Storms.—At the request of Dr. Bauer, measurements were made of the times of occurrence of the rapid movements which sometimes precede magnetic storms. This was done for fifteen specified storms; particulars were also given of the direction and amplitude of the movements. The results, which were given partly in graphical form, were published by Dr. Bauer in *Terrestrial Magnetism*, vol. 16, No. 3, September, 1911.

Electrical Observations.—A number of observations have been made by Mr. Gordon Dobson, Graduate Assistant, since his appointment in October, with a view to improving the several electrical instruments and securing greater certainty in the interpretation of the results obtained with them.

Contributions to Scientific Journals, &c.—A list of contributions to Scientific Journals, &c. is given on p. 21.

Inspections.—Mr. Constable has acted, as in previous years, as inspector of several Meteorological Observatories and Anemograph Stations.

Publication of the Results.—The *Geophysical Journal* (*British Meteorological and Magnetic Year Book, Part III., Section* 2) gives month by month particulars of barometric pressure, air temperature, humidity, wind direction and velocity, amount of cloud and weather at two fixed hours daily, also the daily totals of rainfall and duration of bright sunshine. It further includes for each day the minimum temperature on the grass, earth temperatures at two depths, values of the potential gradient at 4 fixed hours, the electric and magnetic "character," the extreme values of declination and horizontal force, and the ranges of these elements. The results are also given of all the observations of solar radiation with the Ångström pyrheliometer, and of electrical observations made near 3 p.m. with the Ebert and the Wilson apparatus.

Monthly summaries of the diurnal and seasonal variation of the magnetic declination and horizontal force and of the electric potential gradient in the atmosphere are given, with corresponding data for other Meteorological Office Observatories when they are available, in *Hourly Values, Geophysical Section, Part IV., Section* 2, of the same publication, which also contains mean monthly values of magnetic inclination, total force, vertical force, and north and west components, along with a table giving recent mean annual values of the magnetic elements at the Observatories whose publications are received at Kew.

Library.—The Library has received publications from 21 Scientific Societies and Institutions of Great Britain and Ireland, and 131 Colonial and Foreign Scientific Establishments. The card catalogue has been proceeded with.

Requisitions.—Prepared photographic paper, as used at Kew, has been supplied, on requisition, from the other Observatories of the Meteorological Office; the Radcliffe Observatory, Oxford; Hong Kong Government, and the Indian Government.

Educational.—At the request of the India Office a course of magnetic instruction has been given to Lieutenant R. A. Melhuish, R.I.M.

Parties of naval officers from the Navigation School, H.M. Dockyard, Portsmouth, were shown over the Observatory on May 25th and November 9th.

Gassiot Committee Meeting.—The annual meeting of the Gassiot Committee to be held at the Observatory took place on May 31, 1911. The afternoon was the occasion of a remarkable thunderstorm, which has recently been discussed before the Royal Meteorological Society by Mr. J. Fairgrieve.

Loan of Instruments.—The following instruments, apparatus, &c., the property of the Meteorological Office, are at the present date out of the custody of the Superintendent on loan from the Observatory:—

To whom Lent.	Articles.	Date of Loan
The Science and Art Department, South Kensington.	Articles specified in the list given in the Annual Report of the Kew Committee for 1893.	1876
New Zealand Government.	Dip Circle, by Barrow, with one pair of needles and bar magnets, and a tripod stand.	1899
" "	Unifilar Magnetometer, by Jones, marked N. A. B. C.	1909

VI.—Magnetic Observatory.—Eskdale Observatory, Langholm, Dumfries-shire.

Report on the work of the Observatory.

By George W. Walker, M.A., A.R.C.Sc., Superintendent.

Observatory time.—The time used is Greenwich mean time as given by a telegraphic signal at 10 h. daily, except on Sundays and Post Office holidays.

Azimuth of Fixed Mark.—The Pole Star window and theodolite have proved of great service. A number of observations were made to determine the errors of the theodolite, and in May an excellent series of results was obtained, viz.:—

Azimuth of Mark.

11th May ...	8° 12′ 22″ ...	W. of S. ...	6 observations.
18th May ...	8° 12′ 42″ ...	W. of S. ...	4 observations.
20th May ...	8° 12′ 26″ ...	W. of S. ...	6 observations.

The mean 8° 12′ 30″ is the value that has hitherto been used and we may now accept this as the correct value. The error is considered to be not greater than 5″.

The general work of the Observatory may be dealt with under he following heads :—

1. Terrestrial Magnetism.
2. Meteorology.
3. Seismology.
4. Other Observations and Experimental Work.
5. Miscellaneous.

1. **Terrestrial magnetism.**—Absolute observations of Horizontal 'orce, Declination and Inclination have been made weekly in the last Hut during the year. They were made in a manner considered uitable for obtaining relative base values of the magnetographs in short time, while enabling one to assign final values, when ufficient data have been obtained. Details will be found in the Iagnetic Tables in Part IV., Section 2, of the Year Book.

The tabulation of hourly values N, W, V has proceeded day by ay. Provisional values of the maximum and minimum in each omponent with the times of occurrence have appeared month by ionth in the Geophysical Journal. The final tables of hourly alues for N, W, and V, tables of diurnal inequality for each month f N, W, and V as observed ; H, D, and I, as computed ; a table of 'ourier Coefficients containing 24 hr. and 12 hr. terms for , W, V, and a table of mean monthly values of N, W, V, H, D, I nd T have been completed.

The behaviour of the Adie magnetographs recording N and W as been satisfactory. Details will be found in the notes on the Iagnetic Tables. The V recorder has, however, been a great ource of trouble. A daily discontinuity of zero occurred at the me of changing the papers and lights. This probably arose om a temporary strain in the slate slab connecting the pier and ock work pier. In April the Director approved of cutting the strument pier quite free, so that no mechanical shock should cur. The result was completely successful.

The instrument, however, continues to drift and to lose in sensi- veness after any re-adjustment. Steps will be taken to improve atters as soon as the experiments to be described have been mpleted.

An experimental magnetograph for recording W has been run r a considerable part of the year. The needle is 4 cms. long, mm. diam., and is carried by two quartz fibres. Beneath the needle, nd attached to it by a short platinum rod, is a horizontal disc of luminium moving in paraffin oil. The instrument is approximately periodic. The results obtained have been most gratifying, and, some- hat contrary to what might have been expected, there has been o evidence of clogging by the oil. On one occasion the dish ontaining the oil had been moved and the rim of the aluminium disc aught on the side of the dish, but when this had been readjusted he system resumed its normal behaviour. In general the curves re quite similar to those got from the Adie instrument, but in the letails of very small vibrations there is a little difference. This may arise partly from the fact that the experimental instrument is rather more sensitive and the time scale more open, but possibly the

heavy damping has an influence. In fact, one of the objects is to ascertain if heavy damping is desirable or the reverse.

Work with this instrument has been interrupted, as the recording drum was required for examining the behaviour of a new form of V recorder on the principle mentioned last year. The needle is 6 cm. long and 2 mm. diameter and is hung by a pair of quartz fibres so that it is quite insensitive to horizontal forces but sensitive in the vertical plane. The instrument has been made by Messrs. W. G. Pye & Co., with the aid of a grant from the Government Grant Committee. It has been tried for a short time and it will take several months to test fully, but so far the results give promise of success.

The Adie instruments were set to record N and W in July 1910, and in December 1910, readjusted so that their axes lay along and at right angles to what was supposed to be the astronomical meridian. Unfortunately no astronomical meridian had been laid down in the underground house at the time it was made. It would appear that the walls of the house were set parallel and at right angles to what was presumably the average magnetic meridian in 1905. This formed the basis of the provisional line, but little confidence about it could be held. It was rather difficult to know how to get a true meridian in the room, until on 10th January, 1911, it was noticed that the sun shone the whole length of the central passage (over 10 metres). Accordingly, the two outer windows of the porch were removed and the time of transit of the sun's image through a circular hole in a square of black paper stuck on the door was observed at the extreme end of the passage. A line was laid down and a check observation was secured on 12th January. The Astronomer Royal was good enough to check the calculations of the azimuth of the sun and the two observations agreed to 1′. The N.S. line was drawn off on the floor and a parallel line was measured off in the room, by working through the door. The result then showed that the provisional line was not quite correct. The net result according to these observations is that the axis of the W. magnet points 50′ to the West of North and the axis of the N. magnet points 52′ to the South of West.

It was considered undesirable to readjust the magnets as the astronomical meridian should be properly laid down using really good theodolites before doing so. The reduction of the curves has been carried out as if they had been recording the true N. and W. components.

Quick runs were made on the recorders at the times arranged in conjunction with the British Antarctic Expedition, and several very interesting results have been obtained.

2. **Meteorology.**—The work of a first order station has been carried on, except that we have no instrument recording wind direction. Control observations have been made at 9 h. 15 h. and 21 h. The tabulated results have been duly returned to the Meteorological Office, and the results have appeared in the *British Meteorological and Magnetic Year Book*. The turf dyke round the protected rain-gauge was reduced to the level of the rim of the gauge. Comparative results have been sent monthly to the Meteorological Office for examination and analysis.

3. **Seismology.**—The work in this department has developed rapidly and considerably. The Milne recorder has been continued and the results returned monthly to Dr. Milne. A modification of the optical arrangement was introduced, with the result of greatly improved definition.

The Galitzin horizontal seismographs have been in operation throughout the year, and a Seismological Journal of the results obtained goes on daily and has appeared in the Geophysical Journal. This contains a statement of the period and amplitude of the observed microseismic motion characteristic of each day as a whole. There is also a statement of recorded earthquakes in the Göttingen notation, and a column of remarks in which are given the times of occurrence of the phases and the computed epicentre when possible. This is not considered an adequate treatment of the results, but the very great pressure of work has prevented the attempt of what might be regarded as a complete analysis of the records.

In October, 1910, the Gassiot Committee recommended that the Omori Horizontal Seismograph lent by the Japanese Government should be installed here, and in July, 1911, Dr. Schuster supplemented his former gift by presenting the new Galitzin seismograph for the vertical component, exhibited at the meeting of the International Seismological Association at Manchester, July, 1911.

The accommodation of the new instruments in a temporary way (until a suitable seismograph house can be obtained) involved a rearrangement in the main building. The Galitzin vertical seismograph was placed in the original seismograph room along with the Galitzin horizontal seismographs and the Milne seismograph, while a portion of the general laboratory was partitioned off to hold the galvanometer and recording drum. Piers were also made in the laboratory for the Omori instrument and for the Wiechert 80kg. horizontal seismograph. The arrangements were completed in December, and the new instruments were started in January, 1912. The large amount of work involved in running so many instruments required the provision of more assistance, and in September Mr. L. Southerns, B.A., was appointed Professional Assistant. The expense involved by this extension of seismological work has been provided for temporarily by the Royal Society. The new Galitzin seismograph has proved of great value. The zero of the pendulum is, however, very susceptible to change with changing temperature, and as the temperature of the present room is far from constant, continual readjustment is necessary to keep the pendulum free.

The only large earthquake that has occurred since the new instruments were set up occurred on 24th January. Excellent records were obtained on all the instruments except the Omori. In this instrument the multiplying lever appeared defective, and recently an improved device by Dr. Milne was introduced. There has been no large earthquake to test the arrangement, but the instrument is now showing the microseismic movement clearly, which is a favourable sign.

The Superintendent attended the Seismological Conference at Manchester in July, and on Saturday, 22nd July, a party of 20 British and foreign delegates visited the observatory on the invitation of the Director and Sir G. Darwin. The party travelled by train to Carlisle and by motor from Carlisle to Eskdalemuir, returning to Manchester in the same way, after spending about two hours at the observatory. The party included :—Prof. A. Angot, Paris ; Prince Boris Galitzin, St. Petersburg ; Prof. O. Hecker, Strassburg ; Dr. Kövesligethy, Budapest ; Prof. Wiechert, Göttingen ; Prof. Omori, Tokio ; Prof. Reid, Baltimore ; Dr. O. Klotz, Ottawa ; Prof. L. Palazzo, Rome ; Mr. R. D. Oldham ; Prof. A. Schmidt, Stuttgart ; Prof. E. Oddone, Italy ; Prof. Haussmann ; Dr. C. Zeissig ; Dr. Mintrop ; Prof. C. G. Knott, Edinburgh ; and from the numerous letters received since from those who were present, the visit appears to have been greatly appreciated.

During his holiday in October the Superintendent visited Dr. Zeissig, of the seismological station at Jugenheim, who also took him to see the observatory at Heidelberg, Professor Hecker at Strassburg, and Dr. Messerschmidt at Munich. He was received with much kindness, and it was very valuable to see the excellent work going on in these observatories.

4. Other Observational and Experimental Work. Atmospheric Electricity.—The Ebert apparatus got damaged in the end of January, 1911, and had to be sent to the makers for repair. It was not returned till June, when observations were resumed when the weather was favourable. The results have appeared monthly in the *Geophysical Journal.*

The electrograph has been running continuously during the year. The tabulation of hourly values and of maximum and minimum with times has proceeded day by day. The computed values of potential gradient in the open at 3h., 9h., 15h. and 21h. have appeared in the *Geophysical Journal.*

The scale value is determined once a fortnight on the photographic sheet itself in terms of a calibrated Wulf high-potential electrometer. The recording electrometer is a Dolezalek used as a voltmeter with 3 Weston cells across the quadrants. The scale is about 100 volts per centimetre on the paper.

It was doubtful whether the Wulf electrometer had kept constant, and in December, 1910, a second Wulf electrometer was requisitioned so that we might have the means of re-testing at Bushy at intervals. Unfortunately, owing to a series of misunderstandings, the new electrometer did not arrive till September, 1911, and as a consequence several points could not be definitely ascertained until November. Details will be found in the notes to the hourly electric values. Briefly, the points finally established were (1) that the scale value is appreciably affected by change of temperature ; (2) that owing to a settlement of the wall on which the apparatus is carried, the zero of the instrument changes ; (3) that the zero changes owing to a temperature effect in the wall.

The first is sufficiently allowed for by the actual scale determinations, but the second and third can only be dealt with by frequent zeros. As soon as these points were established an arrangement was introduced for automatic zeros on the paper every three hours

instead of only at the start and finish of a record. The results, however, for 1911 are thus affected by a pure diurnal temperature effect that cannot be adequately allowed for.

The sulphur insulation has as before given highly satisfactory results. At certain seasons spiders have given great trouble and a number of records have had to be discarded for this reason.

The factor for converting the electrograph readings to potential gradient in the open has been determined by the method mentioned last year. There appears no reason to believe, when adequate attention is paid to the insulation, to the scale value, and the distance of the jet from the wall, that the factor is other than constant.

New quadrants were obtained for the zinc-copper voltmeter, and the instrument was run in connection with the Dolezalek galvanometer for several months. The results show that the instrument serves the purpose for which it was intended, viz., to give a knowledge of what occurs at the high potentials experienced during precipitation.

A new specimen has been made by Messrs. W. G. Pye & Co. by aid of a grant made by the Government Grant Committee. In this additional damping is introduced electromagnetically. The instrument satisfies ordinary laboratory tests and is in course of installation as a recorder.

Solar Radiation.—Ångström's pyrheliometer has been used as before on suitable occasions between 11h. and 13h. The question of a continuous recorder merits consideration.

5. **Miscellaneous.—Library.**—The Observatory has to acknowledge a large increase in the number of magnetic and seismological reports received from Observatories.

Grounds.—In order to secure protection for the buildings, 1600 young trees have been planted along the south side of the grounds. These have been supplied through the kindness of Mr. J. H. Milne Home, Chamberlain to the Duke of Buccleuch.

Tabulation.—As indicated in the preceding sections, tabulation of all results obtained has gone on day by day, month by month, and the aim has been to have the work ready for publication within a month of the time the observations are made.

The advantage to those engaged in the work is great, as in many cases defects in the instruments are detected and can be removed, which otherwise might not be recognised until serious error had been introduced and might even escape observation altogether.

VII.—Western Observatory.—Valencia Observatory, Cahirciveen, Co. Kerry.

All the self-recording apparatus of a first-order meteorological station have been kept in continuous operation throughout the year, and the hourly tabulations are being published as usual. Cloud observations in connexion with the International investigation of the upper air have been made on the prescribed days of each month.

The fortnightly absolute magnetic observations of declination, inclination and intensity, have been regularly made throughout the year by the Superintendent. The results have been published monthly in the Geophysical Journal.

VIII.—Aerological Observatory at Pyrton Hill.

The general scheme of operations at Pyrton Hill under the direction of Mr. W. H. Dines, F.R.S., has remained unchanged during the year.

International Co-operation.—The dates fixed by the International Commission for Scientific Aeronautics as days of international co-operation in 1911 were :—January 5 ; February 2 ; March 1, 2, 3 ; April 6 ; May 4 ; June 7, 8, 9 ; July 6 ; August 3 ; September 11-16 ; October 5 ; November 9 ; December 6, 7, 8.

The dates in September constituted the special international week for upper air observations, for which the Office arranged to conduct observations at Crinan, Argyllshire, as well as at Pyrton Hill.

During the year a station for the investigation of the upper air has been established at the Mungret College Observatory, Limerick, Ireland, by the Rev. W. O'Leary, S.J., with the aid of a grant from the Royal Meteorological Society and the British Association for the Advancement of Science. Registering balloons have been sent up from the observatory on some of the occasions arranged by the International Commission, and regular records from the observatory are becoming available for comparison with the English results obtained on the same dates.

Registering balloons were liberated from the Manchester University on the international days and the records supplied to the Office as in previous years.

Observations were continued by Mr. C. J. P. Cave at Ditcham Park, Petersfield, and by Mr. S. H. R. Salmon at Brighton, who co-operated in the international scheme throughout the year. Three balloons were sent up by Mr. Marriott on behalf of the Royal Meteorological Society at Liverpool on June 21st, 22nd, and 23rd. In all 81 successful ascents of registering balloons were made, giving satisfactory records to an average height of just under 15 km. Special observations of clouds on the days of international ascents and the days preceding were made at the observatories of Greenwich, Kew, Aberdeen, and Valencia.

The observations of the upper air for the Meteorological Office are partly by means of kites and partly by balloons carrying self-recording instruments, partly also by pilot balloons which are observed from below.

Kite and Balloon Ascents at Pyrton Hill and Crinan.—At Pyrton Hill kites carrying recording apparatus have been sent up regularly throughout the year 1911.

Thirty-two balloons carrying instruments recording temperature and height were sent up from Pyrton Hill in 1911. Each balloon carried a card offering a reward of 5*s.* to the finder upon receipt of the instrument undamaged. In 25 cases out of the 32 the instrument was found and the reward claimed. Nine balloons were liberated from Crinan and five instruments were returned. One ascent only failed to reach the stratosphere and three to reach at least 12 km. One other balloon was reported as found, but the instrument could not be recovered from the finder.

Publication and Discussion of Results.—The results of all the kite and balloon ascents are published in the British Meteorological and Magnetic Year Book, Part I. (Weekly Weather Report). Observations made on the days appointed by the International Commission were forwarded to Professor Hergesell, of Strassburg, for publication also in international form along with the results obtained simultaneously in other countries.

The contribution to the publication of the results at Strassburg by international arrangement has been continued. The latest issue of the publication received before the close of the financial year, 31st March, 1912, was that for February, 1910.

Most of the recording instruments for use at the co-operating stations of the British Isles during the year were made at Pyrton Hill. Instruments have also been supplied for Dr. Simpson to take to the Antarctic and for the Canadian Meteorological Service. The whole number now (June, 1912) made at Pyrton Hill for use with balloons has reached 299.

Mr. W. H. Dines has continued his researches on the correlation of the meteorological elements for the upper air, and the results of his investigations have been printed in Geophysical Memoirs, No. 2 (*see* p. 20).

Mr. C. J. P. Cave, of Ditcham Park, made an expedition to the Scilly Islands in November, 1911, in order to study the structure of the air over a sea district by means of observations of pilot balloons. Mr. Cave was assisted by Mr. J. S. Dines. Two base stations were established on neighbouring islands of the group and a series of successful observations obtained. A paper embodying the results of the observations is in preparation.

IX.—Aberdeen Observatory.

The work of a first order station has been continued as heretofore by Mr. Clarke, under the direction of Professor Charles Niven, F.R.S. The Dines pressure tube anemometer which was installed some years ago for the purpose of comparison with the Robinson anemometer, was lent for a time during the summer to Mr. E. M. Wedderburn for use in connexion with investigation of seiches in the Scottish lochs.

Mr. Clarke has presented to the Office from time to time numerous photographs and sketches of clouds, and has formed an admirable collection of photographs illustrating various cloud forms and phases of cloud formation from which lantern slides for the illustration of lectures can be prepared. A set of consecutive photographs included in this collection, taken within an hour and a half, was selected for reproduction in Geophysical Memoirs, No. 2, in illustration of the hypothesis of cloud formation there put forward.

By arrangement with Professor Niven, a pair of theodolites have been lent to the Observatory for the observation of pilot balloons. Suitable bases have been selected, and a number of soundings have already been made.

X.—Correspondence and Accounts.

Appendix I., p. 57, shows the receipts and payments during the year ended 31st March, 1912. The amount of the Parliamentary vote for Meteorology was £16,850, and the miscellaneous receipts amounted to £6,831 6*s.* 8*d.* Besides these amounts £894 9*s.* 11*d.* has been expended out of the balance to the credit of the account at the beginning of the year in order to meet the cost of special instruments, furniture and fittings of the Office and to pay certain items of ordinary expenditure which were outstanding on 31st March, 1911.

The following abstract shows approximately the net payments of this and the preceding year, together with the increase or decrease in 1911–12, as compared with the previous year :—

Net Expenditure.	1910–11.	1911–12.	Increase.	Decrease.
General Administration :	£	£	£	£
Director	1,000	1,000	—	—
Office Salaries	7,592	7,933	341	—
Rent, Fuel, and Lighting...	697	684	—	13
Alterations to premises and contingencies	576	361	—	215
Postage	635	656	21	—
Telegrams, &c.	1,830	2,168	338	—
Travelling Expenses ...	328	281	—	47
Instruments	376	515	139	—
Observatories :—				
Kew	555	678	123	—
Eskdalemuir	51	256	205	—
Valencia	457	454	—	3
Allowances to other Observatories, Observers, &c.	2,358	2,248	—	110
Superannuation Account	1,060	677	—	383
Total ... ... £	17,515	17,911	1,167	771

In both the years for which the figures are here given the expenditure has exceeded the amount of the Parliamentary Grant by a large sum. The total excess for the two years, £1,802 8*s.* 4*d.*, has been met out of the balance which on 31st March, 1910, stood at £2,206 14*s.* 8*d.* The expenditure has included the whole of the cost of the special furniture and fittings of the new office chargeable to the Committee (with the exception of some items repayable to the Office of Works for which the accounts had not been rendered at the close of the year) in so far as it has not been met by private donations. Much of the excess is therefore expenditure of a non-recurring character, but the whole of the difference cannot be so regarded and the balance on 31st March, 1912, is not more than sufficient to carry on the work of the Office on its present lines beyond the close of the current year.

W. N. SHAW,
Chairman.

July 3, 1912.

APPENDICES.

APPENDIX I.

NT of RECEIPTS and PAYMENTS for the year ended 31st March, 1912:—

RECEIPTS.	£ s. d.	£ s. d.	PAYMENTS.	£ s. d.	£ s. d.
rom year 1910-11	—	1,298 16 3	Director	—	1,000 0 0
ıtary vote ..	—	16,850 0 0	OFFICE SALARIES:		
ERVATORIES:			Monthly	7,720 14 11	
.. .. ..	909 9 8		Weekly	680 12 1	
muir	1,123 15 1				8,401 7 0
a	17 10 0		M.O. OBSERVATORIES:		
		2,050 14 9	Kew	1,587 13 0	
MENTAL EXS REPAID:			Eskdalemuir	1,379 18 7	
			Valencia	471 15 5	
s, &c.	207 10 9				3,439 7 0
Statistics, and vatories	126 13 11		OFFICE EXPENSES:		
ents	133 13 4		Rent, Fuel, &c.	683 16 8	
		467 18 0	Furniture, Fittings, &c.	538 9 10	
AL EXPENSES D:			Incidental	400 3 0	
					1,622 9 6
s, &c.	397 6 10		POSTAGE AND TELEGRAMS:		
ranches	66 6 5				
ry Office Ac-			General Postage ..	306 16 2	
.. .. ..	52 5 11		Postage of Daily Weather Reports ..	348 19 2	
		515 19 2	Telegrams, &c.	2,831 13 5	
					3,487 8 9
PH CHARGES D:			TRAVELLING EXPENSES AND INSPECTIONS ..	—	280 13 9
.. .. ..	229 12 11				
ns sent abroad	433 16 7		SUPERANNUATION ..	—	1,382 2 0
		663 9 6			
NTS:			COST OF INSTRUMENTS:		
avy	512 4 6				
ile Marine, Sta-			Royal Navy	510 8 6	
tc.	1,130 13 10		Mercantile Marine, Stations, &c.	1,647 15 6	
		1,642 18 4			2,158 4 0
ORY FORMS, &C.	—	138 2 0	AUXILIARY OBSERVATORIES, &C.	—	2,386 11 3
TUATION AC-					
:			LECTURES AND EXPERIMENTS	—	417 13 4
s	606 17 6				
on Investment	80 15 10		BALANCE:		
Tax—Returned	17 10 0		Cash at Bank	361 17 0	
		705 3 4	„ at Office	42 9 4	
AND EXPERI-	—	585 12 7			404 6 4
for Memorial	—	61 9 0			
		£24,980 2 11			£24,980 2 11

1 31st March, 1912, the amount of 2½ per cent. Annuities held for he provision of Superannuation was £2,119 5s. 11*d.*

APPENDIX II.

STATEMENT OF PROVISIONS FOR THE SUPPLY OF INFORMATION TO THE PUBLIC, 1911–12.

THE METEOROLOGICAL OFFICE.

The office was established in 1854 as a department of the Board of Trade. From 1866 to 1877, with a Parliamentary Grant in Aid, it was under the management of a Committee, and from 1877 to 1905 under a Council appointed by the Royal Society. It is now under the control of a Director and Committee appointed by H.M. Treasury.

Kew Observatory and the Eskdalemuir Magnetic Observatory were transferred from the National Physical Laboratory, July 1, 1910, with subventions from the Royal Society. The Gassiot Committee appointed by the Royal Society consisting of the officers of the Society and fifteen other members acts as an Advisory Committee for the work at the Observatories.

Director :

WILLIAM NAPIER SHAW, LL.D., Sc.D., F.R.S.

Marine Superintendent :

Commander M. W. CAMPBELL HEPWORTH, C.B., R.D., R.N.R.

Superintendent of Forecast Division :

R. G. K. LEMPFERT, M.A.

Superintendent of Statistics :

E. GOLD, M.A.

Superintendent of Instruments :

Chief Clerk and Cashier :

JOHN A. CURTIS.

OFFICE PREMISES.

Exhibition Road, South Kensington.

Telegraphic address—"Weather, London."

Office hours and general arrangements.—The Office is open general inquiries between the hours of 10 a.m. and 4 p.m. on days (Saturdays, 1 p.m.), and for inquiries for forecasts and information concerning the present weather conditions (*see* Se

legraphic Information) from 8.30 a.m. to 8 p.m. on week days, om 6 p.m. to 8 p.m. on Sundays.

communications should be addressed to the Director.

ques, &c., should be crossed "Bank of England, Western h," and be made payable to the "Meteorological Committee."

ply of Information and Charges.—The books and documents Office library, and the manuscript returns in the possession of ffice, may be consulted or copied at the Office, free of charge, y person, by permission of the Director. Extracts from them upplied to any person making written application to the tor specifying precisely the details of the information required. hese extracts a charge is made to cover the cost of the time ed for selecting and making them. The usual minimum e is 5*s*. There are certain special exceptions with a smaller e; a schedule of these will be sent on application.

extracts will, if required, be attested by a sworn declaration a Commissioner for Oaths, at a fee of £1 1*s*. (in addition to harge of 1*s*. 6*d*. made by the Commissioner for Oaths). A l fee of from £2 2*s*. for each day's attendance is charged if a entative is required to attend in court in London with nce to the statements contained in the extracts supplied.

facilities for the supply of information have been classified the following heads :—

. Marine Information.

. Telegraphic Information.

Daily Weather Reports, Forecasts and Storm Warnings.

. Statistical Information.

The British Meteorological and Magnetic Year Book—

Part I., Weekly Weather Report.

Part II., Monthly Weather Report, with annual Summary.

Part III. (1), Daily Readings at Meteorological Stations of the First and Second Orders.

Part III. (2), Geophysical Journal. Daily Values for Meteorology, Solar Radiation, Seismology, Atmospheric Electricity and Terrestrial Magnetism, with supplements giving the results of observations in the upper air.

Part IV. (1), Hourly Values from Autographic Records. Meteorological Section (Pressure, Temperature, Humidity, Rainfall and Sunshine) at Valencia, Kew, and Eskdalemuir.

Part IV. (2), Hourly Values from Autographic Records. Geophysical Section (Terrestrial Magnetism, Atmospheric Electricity and Meteorology).

Unpublished Observations.

. Information from land stations outside the British Isles.

. The Library and Museum.

. Supply of Instruments and Forms to Observers.

Fishery Barometers.

. Publication of Observations contributed by Volunteer Observers or by the Representatives of Local Authorities.

H. Regulations for the Supply of Information from Instruments belonging to the Meteorological Office by the Custodians of the Instruments.
I. Observatories and Stations in connexion with the Meteorological Office.
K. List of Publications of the Office.
L. Publications of the International Meteorological Committee.

A.—Marine Information.

General Information.—Observations have been forwarded to the Office, in special log books and registers, since 1855, by officers of the Royal Navy and the Mercantile Marine, and this valuable co-operation continues. In addition a large number of logs and remark books kept on board H.M. ships have been lent to the Office by the Admiralty, and by the large shipping firms, from time to time, for the purpose of extracting meteorological data. The information thus received is dealt with in various ways, and the results, which are published for the benefit of seamen and others, are indicated in Section K. Copies of these publications are presented from time to time to officers who contribute regular returns.

Information is given to seamen, upon application to the Meteorological Office, either in person or by letter, with respect to the meteorological conditions likely to prevail along a proposed route, either for sailing vessels or for steamships.

Monthly Charts.—Meteorological Charts of the North Atlantic and Mediterranean have appeared each month since 1901, and a similar monthly series for the Indian Ocean and Red Sea since May, 1906. In May, 1910, the latter series was extended southward, so as to include all parts of the ocean as far south as the parallel of 35° S. Commencing with the issue of May, 1911, this chart was extended eastward to the 125th meridian of east longitude; and its scale was altered to make the chart uniform with that of the Atlantic.

The temperature of the sea surface is differentiated by grades of colouring in blue; and isobars and isotherms are shown on the face of the chart, and by means of an inset chart. Magnetic variation curves are for 1912. On the face of these charts there are graphically represented, for the respective ocean areas, the normal winds, surface currents, distribution of atmospheric pressure, the magnetic variation, and the best routes for sailing vessels and steamships, according to the season. On the North Atlantic charts, in addition, there are given the average limits of trade winds, gales, fog, and ice; mean paths of centres of cyclones; storm signals, and radio-telegraphy stations; time of high water at Dover; recent reports of ice, including, in the months of April, May, June, November and December, the latest intelligence, by cablegram, from the Signal Service of Canada, in regard to the state of the ice in the Gulf of St. Lawrence and its approaches. A weekly edition of this series

has been issued since April, 1910. On the Indian Ocean charts there are given the average limits of trade winds and monsoons, surface temperature and currents near Cape Guardafui ; information relative to the meteorology of the Red Sea ; and tracks of cyclones in the Bay of Bengal, the Arabian Sea, and the South Indian Ocean, and storm-warning signals at Indian ports. During the south-west monsoon season, cable notices from the Director General of Indian Observatories, with respect to the weather conditions in the Arabian Sea and Bay of Bengal, are also given.

Daily Synoptic Charts of the N. Atlantic. Weekly Charts of Sea Surface Temperature.—Since April, 1910, the charts of the North Atlantic and Mediterranean have been issued in weekly instalments. This arrangement affords an opportunity for including on the backs of the charts seven maps giving the distribution of pressure and other elements on each day of the week ended on the day before the issue of the chart, over Europe, the North Atlantic, and the East of America. The charts are prepared from reports received from land stations in Europe in connexion with the telegraphic work of the Office, from reports from ships of His Majesty's navy and the mercantile marine received by wireless telegraphy, from Meteorological Office log-books and other nautical documents, and from the information for American stations published in the Bulletin International, issued by the Bureau Central Météorologique in Paris. Five charts are also shown giving for successive periods of seven days the most recent information regarding the temperature of the sea surface and of the air over the North Atlantic, also the geographical positions in which fog was recorded. On a similar chart there are given the normal distributions of air and sea temperature for the respective periods. The most recent information as to the occurrence of ice both in the Gulf of St. Lawrence and in the open ocean, and as to derelicts, is also included.

Special Articles.—The special features of the current issue of the Meteorological Charts of the North Atlantic and Mediterranean, include monthly inset charts showing the percentages of fog, mist, and gales over the North Atlantic for each month ; the latest information to hand up to the time of going to press with respect to ice in the Southern Ocean ; Arctic weather of 1911 ; phenomenal drifts and numbers of derelict ships ; lists of submarine and radio-telegraphy stations on either side of the North Atlantic ; phenomenal drifts and heights of icebergs ; Eiffel Tower wireless weather report system ; West India hurricanes ; North Sea gales of September ; and a description of rollers at Mogador.

On the backs of the Meteorological Charts of the Indian Ocean and Red Sea information has been given relative to various subjects which are of importance to navigators and others. Among the items dealt with, in some instances illustrated by diagrams, are the following :—Icebergs and field ice in the Southern Hemisphere ; cyclonic storms of the Arabian Sea, the Bay of Bengal, and the China Sea ; typhoons of the North Pacific ; Fiji hurricanes of March, 1910 ; weather conditions between Cape and Australia in 1910 ; currents on the Bombay and Aden route ; ocean waves ; submarine seismic disturbances ; and Eiffel Tower wireless signals.

Terms of Subscription.—Copies of both series of charts may be obtained from the Superintendents of the Mercantile Marine Offices at the principal ports of the United Kingdom, by captains and officers of merchant ships, price 6*d.* each. They may also be purchased from the Admiralty agents for the sale of charts, and from the agents for His Majesty's Stationery Office at Edinburgh, and at Dublin, at the rate of 5*s.* for an annual series of 12 charts, or 6*d.* for each chart, in addition to the cost of transmission. The Indian Ocean Charts are also obtainable on similar or equivalent terms from Messrs. James Murray and Company, at Calcutta, and at the shipping offices at Bombay and Madras. Captains and officers who co-operate with the Meteorological Office by sending regular reports receive copies of the Monthly Meteorological Charts free.

Dates of Issue of the Charts.—The weekly instalments of the Monthly Charts of the North Atlantic and Mediterranean appear on Thursday of each week. The Charts of the Indian Ocean are published on the Thursday nearest to the 1st day of the month preceding that to which the information refers.

Instruments for Observers.—Subject to certain regulations the instruments necessary for the keeping of a Meteorological Log Book will be lent by the Office to the captains of British ships who undertake to make regular four-hourly records during their voyages to and from foreign ports, enter them in the specially arranged log book provided for the purpose, and return the latter, on completion, to the Marine Superintendent. A rough book for entering up the observations when taken, is also supplied, and this becomes the property of the captain for future reference. The set of instruments lent to captains by the Meteorological Office comprises one mercury barometer, five thermometers, with screen, for registering the shade temperature of the external air and the temperature of the sea surface, and three hydrometers. The expenses incurred by the co-operating captains with respect to postage of log books and the transit of instruments, are borne by the Meteorological Office.

The ships are supplied either directly from the Meteorological Office or through the following agents :—

Cardiff—Captain J. Weir, Examiner of Masters and Mates, Local Marine Board.

Dundee—Captain J. A. S. Chalmers, Examiner of Masters and Mates, Local Marine Board.

Glasgow—Messrs. D. McGregor & Co., Ltd., 57, Bothwell Street.

Greenock—Messrs. D. McGregor & Co., Ltd., 33, Cathcart Street.

Hull—Captain W. Ellery, Examiner of Masters and Mates, Mercantile Marine Office.

Liverpool—Commander F. M. Sergeant, R.D., R.N.R., Chief Examiner and Secretary, Local Marine Board, Canning Place (E.).

Southampton—Captain D. Forbes, 169, High Street.
Sunderland—Messrs. J. J. Wilson & Son, 18, Hudson Road.

Sets of instruments are kept in working order at the Office in London, and at each agency, for the purpose of instructing observers in the method of observation.

B.—Telegraphic Information.

Daily Weather Reports. Forecasts and Storm Warnings.

Between 7.15 a.m. and 9.30 a.m. telegraphic messages are received daily, reporting meteorological observations at 29 stations (marked T in list of stations, Section I) in the British Isles, chiefly on the coast, at 40 stations on the Continent of Europe and the islands of the North Atlantic (*see* p. 108). The observations are now made at 7 a.m. at all stations, except Oxford, Lisbon, and the Azores. A certain number of stations report evening observations (6 p.m.), also by telegraph, and those that do not report in the evening include the evening observations with the following morning reports, so that a complete schedule of morning and evening observations is drawn up daily. The information refers to the readings of the barometer, dry bulb thermometer, maximum and minimum thermometers, rainfall, and in some cases, sunshine, with estimates of the direction and force of the wind, and reports of the weather and state of the sea. The observations received from Iceland give only the readings of the barometer, the dry bulb thermometer, the direction and force of the wind, and the state of the weather.

These reports are supplemented by a number of additional observations made at various stations in the United Kingdom and sent, either by telegram or by post, by private persons or local officials. Moreover, the "Bulletin International" published in Paris, reproducing meteorological telegrams from the whole of Europe, is received by post on the morning of the day after publication, and supplements the information previously received in the Office by telegram.

Through the courtesy of the Lords Commissioners of the Admiralty a daily report is received by "wireless" from Gibraltar and occasional reports of observations at sea off our southern and western coasts are transmitted by wireless telegraphy from the ships of H.M. Navy. Wireless reports are also received almost daily from ocean liners crossing the Atlantic.

The telegraphic information is tabulated and charted by about 9 a.m. for the morning observations, and 7 p.m. for the evening ones. A general report is then drawn up, and forecasts of the weather, for the twenty-four hours following the next noon, or midnight, as the case may be, are formulated; a note as to the further outlook is added if the meteorological conditions are such as to justify an anticipation for more than twenty-four hours ahead.

At a selection of stations additional observations are taken and telegraphed to the Office at 1 p.m., and occasionally modifications are made in the morning forecasts as a result of these observations. This information is usually available by 2 p.m.

Forecast Districts.—For the purposes of forecasts of weather the region of the British Isles is divided into land districts and sea districts, as indicated in the accompanying map.

Forecast Districts.

Land.*	Sea.
0. Scotland, North. (*a.*) Islands. (*b.*) Mainland.	A. Shetland to the Naze.
1. Scotland, East.	B. Shetland and Orkney.
2. England, North-East. (*a.*) North. (*b.*) South.	C. East of Scotland.
3. England, East.	D. Great Fishery and Dogger Banks.
4. Midland Counties. (*a.*) East. (*b.*) West.	E. North Sea, North of the Humber.
5. England, South-East.	F. North Sea, South of the Humber.
6. (*a.*) Scotland, West. (*b.*) Isle of Man.	G. Straits of Dover.
7. (*a.*) England, N.W. (*b.*) North Wales.	H. English Channel, Central Reach.
8. (*a.*) South Wales. (*b.*) England, S.W.	J. English Channel, Western Portion.
9. Ireland, North. (*a.*) West. (*b.*) East.	K. Bristol Channel.
10. Ireland, South. (*a.*) East. (*b.*) West.	L. Southward and South-Westward of Ireland.
11. Mouth of Channel and Bay of Biscay.	M. St. George's Channel.
	N. Irish Sea.
	P. North Channel.
	R. North-Westward of Ireland.
	S. The Minch.

* For the grouping of the counties to represent approximately the forecast *districts, see* List of Stations (Section I).

The Distribution of Forecasts and Telegraphic Intelligence.

Daily Weather Report.—A Daily Weather Report, which includes a transcript of the observations for the day, with some of those for the previous day, illustrative charts, descriptive remarks on the state of the weather, and the weather prospects for the several districts of the British Isles and for the Bay of Biscay, is prepared for press at 11 a.m. daily, except on Sundays and Bank Holidays. Advance copies of the report can be obtained at the Office at noon, and the final copies are ready for issue by 1 p.m. The report is delivered by hand or posted at the G.P.O. at 1.30 p.m. to those addresses which can be reached in the regular course of post on the same day. Copies for those who are outside this limit are posted by the evening mails.

Subscriptions.—The Daily Weather Report may be obtained on payment in advance at the Meteorological Office of a subscription representing the cost of transmission (postage and wrappers). The subscription for this service, if for not less than a quarter of a year ending at the official quarter days, *e.g.*, March 31, June 30, &c., is at the rate of £1 per annum for delivery by book post; £2 for delivery, where feasible, by hand. Copies for other periods than the official quarters of a year are charged at the rate of 2*s.* for a calendar month, and 1*d.* per copy for periods of less than a month. When two copies are required to be sent by post each day, in the same envelope, the charge is 7*s.* per official quarter or £1 7*s.* 0*d.* per annum. Single copies, price 1*d.* each, can be obtained on the day of issue at the Office, and after 2 p.m. at the railway bookstalls at the following terminus stations:—Victoria (L.B.S.C., and S.E. & C. Railways), Charing Cross, King's Cross, St. Pancras, Euston.

Supply of Reports for Educational Purposes.—By arrangement with H.M. Stationery Office, upon giving the necessary notice, additional copies of the Daily Weather Report for one day, or a succession of days, will be printed off and supplied to School Authorities for class use at the rate of 7*d.* for 10 copies, exclusive of postage.

Surplus copies of charts prepared for exhibition, or of back numbers of the Daily Report, are available for educational purposes upon application to the Director. No charge is made for this service, but the cost of postage must be defrayed.

Reports for the Press.—Special advance copies of the descriptive remarks on the state of the weather and forecasts, based upon the morning or evening observations, are prepared at 10 a.m. and 7 p.m. respectively. These are supplied gratis to the representative of any newspaper or press agency calling for them at the Office at the hours named.

From May 1st, 1912, arrangements have been made to issue upon the same terms a schedule of the observations made at 6 p.m. at Health Resorts which have communicated to the Office by telegrams received up to 7 p.m. These schedules are ready for issue at 7.15 p.m. each evening.

As far as practicable the Director, upon application, will make arrangements for the transcription of the whole or a selection of

the morning or evening telegraphic reports, to be sent by telegraph, in code form, to newspapers or public associations desiring to make use of this means of accelerating the distribution of the latest information about the weather. The special terms for this service can be obtained on application to the Office.

The Director will also arrange for the supply of daily or weekly reports of the state of the weather, in special form, upon terms which may be had upon application at the Office personally or by letter.

Forecasts by Telegraph.—The *latest information for any district, or the latest forecast*, will be sent by telegraph to any address if a request be received by post stating when the information or forecast is to be sent, and enclosing 6*d. in addition to the cost of a telegram*, allowing for not less than ten words in addition to the address. To avoid delay, letters of request for telegraphic information or forecasts should be marked on the outside "Forecast Division."

By arrangement with H.M. Postmaster-General (*see* the Post-Office Guide, "Meteorological Telegrams"), the latest information as to the state of the weather in various parts of the United Kingdom, or the Continent, and forecasts for one day in advance, can be obtained from the Meteorological Office, upon payment at any Postal Telegraph Office of a fee of 6*d.* in addition to the cost of a telegram of inquiry addressed "Weather, London," and of the reply. At least ten words, in addition to the address, must be allowed for the reply.

Telegrams of inquiry should state the nature of the information required, and the name and address to which the information is to be sent, as in the following examples :—

To "Weather, London."

Latest Information from [*Straits of Dover*].

or,

Latest Forecast for [*Forfarshire*].

or,

Next Forecast for [*Dublin*].

From (Name), (Address).

Forecasts by Telephone.—Forecasts will be sent in reply to enquiries by telephone if a sum has been previously deposited with the Office to cover the authorised charges for departmental expenses. Further information as to the service by telephone can be obtained on application at the Office.*

Written Special Forecasts.—A written copy of the latest forecasts for a single district can be obtained at the Office between 9.30 a.m. and 8 p.m. upon payment of 6*d.* A written copy of the latest

* *Note.*—A forecast is a statement of the weather to be expected during the period to which the forecast refers, arranged, generally speaking, as follows :—Direction and force of the wind, state of the sky as regards cloud, prospect of rain, snow, or thunder, temperature, and, in the case of the sea districts, sea disturbance. For example, the forecast for a land district referring to the twenty-four hours from the following noon or midnight, according to the time of issue, may read : "Light south-easterly to easterly winds ; fine at first, cloudy later, with local thunder showers. Becoming cooler." The forecast for a sea district may read : "Strong southerly and south-westerly winds, with squally, showery weather and a rough sea."

information in possession of the Office as to the state of the weather in any district of the British Isles, and for the neighbouring parts of the continent of Europe, can also be obtained.

Forecasts in Anticipation of Special Conditions.—The Office will send by telegraph or telephone forecasts in anticipation of special conditions, such as spell of frost or of dry weather, smooth sea, &c. If the time of sending the forecast be left to the discretion of the Office a fee of 2*s.* 6*d.*, which includes the cost of the telegram, is charged for this service.

Forecasts, &c., for Public Exhibition.—The latest reports, with a map, and forecasts for the land districts and for the Western Channel and Bay of Biscay are exhibited as early as possible, for the information of the public, at the entrance to the Office, and, by the courtesy of His Majesty's Office of Works, in St. James's Park, opposite the Horse Guards.

Typewritten copies of the morning forecasts for all districts are ready at 10 a.m , and are distributed by hand to clubs and societies situated in or near Pall Mall at a charge of 10*s.* per annum. They are sent by post at a charge of 2*s.* 6*d.* per official quarter or any part thereof, in addition to the cost of transmission. Copies of the evening forecasts are sent by post for a similar charge.

Forecasts for a single district will be sent regularly by telegraph to public bodies for exhibition without any charge beyond the cost of the telegrams, and to private persons at an additional charge of 3*d.* per telegram for a forecast for a single district, and 6*d.* for two or more districts.

Harvest Weather Forecasts.—Arrangements have been made for a special service of afternoon reports during the season of the Hay and Corn Harvests (June 1st to September 30th), with a view to a special series of forecasts daily (Sundays excepted) at 2.30 p.m. The forecasts for any district are supplied by telegraph to agriculturists and others upon prepayment of the cost of the telegrams (sixteen words daily in addition to the address) for the period during which the forecasts are required. Forms of application for these forecasts can be obtained at the Office.

The Postmaster-General has sanctioned the exhibition of Forecasts at Local Post Offices, provided space is available, if the persons to whom they are addressed desire them to be so exhibited.

Notification of Spell of Settled Weather.—In order to make the fullest use of the information available, when the weather appears likely to be settled for some days, provision has been made for sending telegraphic notifications of the expected commencement of spells of fine weather, and such further notifications as may be necessary in order to keep the recipient informed of the course which is being followed. For this service a fee of 5*s.*, which includes the cost of the telegrams, is payable in advance for each spell.

Storm Warnings.

The Office issues notices of threatening atmospherical disturbances on or near the coasts of the British Islands (free of charge) to ports and fishing stations recommended by responsible local authorities.

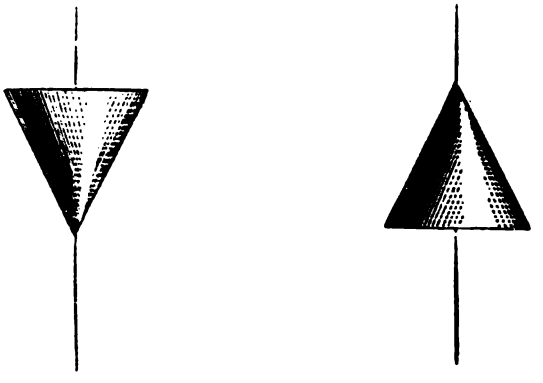
The issue of a warning indicates that an atmospheric disturbance is in existence which will *probably* cause a gale within a distance of (say) 50 miles of the place to which the warning is sent. The Signal Station itself is sometimes comparatively sheltered. The meaning of the warning is simply, "Look out! Bad weather of such and such a character is probably approaching you."

Storm Signals.—The fact that one of these notices has been received at any storm signal station is made known by hoisting a black canvas cone, 3 feet high, and 3 feet wide at base, which has the appearance of a triangle when hoisted.

STORM SIGNALS EXHIBITED.

DAY SIGNALS.

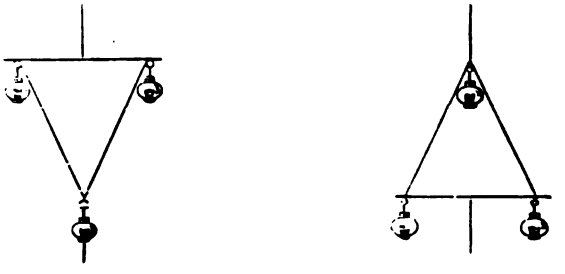
South Cone. North Cone.



NIGHT SIGNALS

(Instead of the cone), Lights in Triangle.

For South Cone. For North Cone.



Three lanterns and one yard, 4 ft. long, will be sufficient.

The "*South*" *Cone* (point downwards) is hoisted for gales and strong winds—

From S.E., veering to S.W., W., or N.W.,
„ S.W., veering to W. or N.W.,
„ W., veering to N.W.,

and also from E., veering to S. or S.W.

The "*North*" *Cone* (point upwards) is hoisted for gales and strong winds—

From S.E., E., or N.E., backing to N.,
„ N.W., veering to N., N.E., or E.,
„ N., veering to N.E. or E.,
„ N.E., veering to E.

Sudden Shifts of Wind.—A Southerly gale often *veers* quickly to a point North of West, but a gale from the Eastward is more likely to *back* to the *Northward.*

It is important to bear this in mind, especially in anchorages or harbours exposed to the Northward.

Night Signals.—At dusk, whenever a signal ought to be flying if it were daylight, a *Night Signal,* consisting of three lanterns hung on a triangular frame, may be hoisted in place of the cone, point downwards (for South Cone), or point upwards (for North Cone), as the case may be.

Duration of Warning.—The warning is intended to continue from the time the telegram leaves the Meteorological Office until 8 o'clock on the evening of the following day.

Gales sometimes follow one another in quick succession. An order to "Keep up" will be sent if the warning is to be continued beyond the ordinary limits ; and an order to "Lower" will be sent if there is reason to believe that danger is over before the regular time has lapsed.

If a gale has commenced before warnings are issued, notice to hoist the cone will still be sent if it is expected that the gale will continue, or increase in force, but not otherwise.

Exhibition of Telegrams.—The telegrams directing the cone to be hoisted should be exhibited near the signal staff. A card providing space for the exhibition of the telegrams and giving information as to the meaning of the signals is supplied for the purpose.

Supply of Cones, &c.—The Meteorological Office supplies the canvas cone and a card providing space for the exhibition of the telegrams and giving information as to the meaning of the warnings, but it does not supply the lanterns for night signals. In all cases the local authorities must undertake the charges incidental to the hoisting of the signal, such as the provision of a flagstaff and gear, oil, &c., and also those connected with the keeping of the apparatus in repair. Frames suitable for the exhibition of the telegrams in the card referred to above can be purchased on terms which can be obtained on application to the Office.

List of Storm Signal Stations.

The following is a List of Stations to which Storm-warning telegrams are sent :—

I. *Scotland, N.E.—A. Northern Section. Shetland, Orkney and North Coast of Scotland.*—Lerwick, *Scalloway, *Dunrossness, Sumburgh Head L.H., Fair Isle L.H., Noup Head L.H., Stromness, Kirkwall, Cantick Head L.H., Thurso, Dunnet Head, Wick.

* Telegrams only exhibited.

B. Southern Section. East Coast from Harril Head to Stonehaven
Tarbet Ness L.H., Cromarty, *Avoch, Inverness, Nairn, Burghe
Lossiemouth, Buckie, Port Knockie, Cullen, Portsoy, Banff, Fras
burgh, Peterhead, Aberdeen, Girdleness L.H., Scurdy Ness L.
Montrose, Stonehaven.

II. *Scotland, E.—Stonehaven to the Tweed.*—Broughty Fer
Dundee, St. Andrews, Anstruther, Buckhaven, Methil, Wem
West, Burntisland, Grangemouth, Bo'ness, Granton, Newhav
†Leith, Fisherrow, Dunbar, Cockburnspath, St. Abb's He
St. Abbs, Eyemouth, Berwick-on-Tweed.

III. *Scotland, N.W.—Kyle of Durness to Firth of Lorne*
Cape Wrath L.H., Stoerhead L.H., *Port of Ness, Stornow
Island Glass L.H. (Scalpay).

IV. *Scotland, W. and North Channel.—From Firth of Lorn
Barrow Head, and from Fair Head to Strangford Lough*
*Glasgow, Greenock, *Rothesay, Lamlash, Carradale, Campl
town, Mull of Cantire L.H., Rhuvaal L.H., Rhinns of Islay L.
Ardrossan, Ballantrae, Cairn Ryan, Corsewall Point L.H., M
of Galloway L.H., Belfast, Donaghadee.

V. *Ireland, N.—Fair Head to Galway Bay.*—Killybegs L.
Mulroy, Fanad Point (Lough Swilly) L.H., Rathmullen, Ma
Head, Portrush, Port Ballintrae.

VI. *Ireland, S.—Galway Bay to Carnsore Point.*—Tuskar L.
Dunmore East, Dungarvan, Helvick Head, Minehead L.
Youghal, Queenstown, Cork, Passage, Kinsale, Kinsale (Old Hea
Galley Head L.H., Castletownshend, Brow Head, Dingle, Tra
(Fenit), Limerick, Loophead L.H.

VII. *Irish Sea.—South of a line from Strangford Lough
Barrow Head and North of Lat. 53° N.*—Howth, Kingstown, P
of Ayre, Ramsey, Douglas, Silloth, Maryport, Workington, Wh
haven, Barrow, Walney Island L.H., Morecambe, Fleetw
Blackpool, Lytham, Preston, Southport, Formby, Liverpool, I
corn, New Brighton, Hoylake, New Ferry, Rhyl, Port Penr
Point Lynas L.H., Holyhead, South Stack L.H., Carna
Port Dinorwic.

VIII. *St. George's Channel.*—Aberystwyth.

IX. *Bristol Channel.—St. David's Head to River Ca*
Smalls L.H., *Milford, St. Ann's Head, Caldy L.H., T
Pembrey (Burry Port), Llanelly, Swansea, Briton Ferry, Port
Nash L.H., Penarth, Cardiff (Bute Dock and Barry Dock)
port, Weston-super-Mare, Burnham, Bridgwater, Minehead
combe, Bull Point L.H., Barnstaple, Appledore, Hartland
L.H., Lundy Island.

X. *England, S.W.—River Camel to River Exe.*—Por
Newquay, Godrevy L.H., Hayle, St. Ives, St. Sennen,
West, Padstow, Penzance, Porthleven, Scilly, the Lizar
Falmouth (Pendennis Castle), Fowey, Plymouth, Devonpo
Wise and the †Dockyard), Prawle Point, Salcombe, Te
Exmouth.

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* Telegrams only exhibited.
† Arrangements made for showing signals or illuminating the co

XI. *England, S.—River Exe to Beachy Head with Channel Isles.*—Guernsey, Jersey (St. Helier's), Portland Dockyard, Portland L.H., Weymouth, Anvil Point L.H., Poole, Hurst Castle L.H., Southampton, Yarmouth (I. of W.), Cowes, Ryde, St. Catherine's Point, Portsmouth (Dockyard and Horse Sand Fort), Littlehampton, Brighton, *Newhaven.

XII. *England, S.E.—Beachy Head to Shoeburyness.*—Beachy Head, Eastbourne, *Hastings, Rye, Sandgate, Dover, Deal, Ramsgate, Margate, Faversham, Sheerness, Chatham, Greenhithe, Shoeburyness.

XIII. *England, N.E.—From the Tweed to the Humber.*—Blyth, Tynemouth, South Shields, Souter Point L.H., Sunderland, Hartlepool, *Middlesbrough, Redcar, Whitby, Filey, Flamborough (2 stations), Bridlington.

XIV. *England, E.—From the Humber to Shoeburyness.*—Hull, Goole, Grimsby, Boston, Sutton Bridge, Lynn, Sheringham, Cromer, Great Yarmouth, Gorleston, Southwold, Orford Ness L.H., Ipswich, Harwich, Gunfleet L.H., West Mersea.

C.—Statistical Information.

The British Meteorological and Magnetic Year Book.

Terms of Subscription.—The Statistical Publications of the Office have been grouped together under the general title "British Meteorological and Magnetic Year Book." For 1912 the Year Book consists of four parts, as follows :—

Part I.—**The Weekly Weather Report.** Issued on Thursday of each week. Price 6*d.* per number. Annual subscription (which includes the Monthly Weather Report, *see* below) 30*s.* postage paid. The appendices to the report can be obtained separately, price from 4*d.* each.

Part II.—**The Monthly Weather Report** with an annual summary. Issued on the 27th of each month as a supplement to the Weekly Weather Report. Price 6*d.* each issue.

Part III.—(1) **Daily Readings** at Meteorological Stations of the First and Second Orders. Issued in monthly parts, within about five weeks of the close of each month. Price 1*s.* each issue. Annual Volume consisting of 12 monthly numbers with Introduction, Title Page and Map, 10*s.* 6*d.*

(2) **The Geophysical Journal.** Daily observations (Meteorology, Terrestrial Magnetism, Atmospheric Electricity, Seismology, &c.) at the Meteorological Office Observatories (Valencia, Kew, Eskdalemuir) and principal Anemograph Stations, together with records of Temperature, Humidity and Wind in the free atmosphere, obtained by means of kites, balloons and pilot balloons. Price, 4*d.* each issue. Annual Volume consisting of 12 monthly numbers, with Introduction, Title Page, and Summary. Price 5*s.*

* Arrangements made for showing signals or illuminating the cone at night

Part IV.—(1) **Hourly Values** from Autographic Records. **Meteorological Section. Hourly Readings** of Pressure, Temperature, Wind, Rainfall, Humidity and Sunshine, at the Meteorological Office Observatories (Valencia, Kew, Eskdalemuir). Issued in monthly sections for each observatory. Price 6*d.* each section.

(2) **Hourly Values** from Autographic Records. **Geophysical Section. Hourly Readings** of the components of Terrestrial Magnetic force at Eskdalemuir, with monthly and annual **Summaries of Hourly Values** of Meteorological and Geophysical data at the five Observatories, Kew, Eskdalemuir, Valencia, Aberdeen, Falmouth. Annual Volume with Title Page and Introduction.

Parts I. and II. of the Year Book can be purchased either directly or through any bookseller from the Agents to H.M. Stationery Office, Messrs. Wyman & Sons, Fetter Lane, E.C., Oliver and Boyd, Edinburgh, and E. Ponsonby, 116, Grafton Street, Dublin. Parts III. and IV. are on sale at the Meteorological Office only. (For terms of subscription to the Daily Weather Report, *see* p. 65.)

Copies of the British Meteorological and Magnetic Year Book are sent to the following public libraries and private institutions:—

1. *The Complete British Meteorological and Magnetic Year Book:*—
   London: The British Museum, London School of Economics, Royal Astronomical Society, Royal Meteorological Society, Royal Institution, Royal Observatory (Greenwich), Board of Education (Science Library, South Kensington), The Metropolitan Water Board, British Rainfall Organisation, University College for British Association Library, Kew Observatory; Birmingham, Public Library; Birmingham, University Library; Liverpool, Public Library; Edinburgh, University Library; Oxford, Radcliffe Observatory.
2. *Parts I., II., III.* (1) *and IV.*:—
   London: Guildhall Library, Imperial Institute, Lloyd's, Royal United Service Institution, London Institution, Greenwich Royal Naval College, Institution of Civil Engineers.
3. *Parts I., II., and III.* (1) (2):—
   London: Board of Agriculture and Fisheries, The Admiralty, Royal Geographical Society.
4. *Parts I., II. and III.* (2):—
   Manchester University Physical Laboratory.
5. *Parts I. and II.*:—
   London: Royal Botanic Gardens, The Royal Society of Arts, General Register Office, Local Government Board, Board of Trade; Aberystwyth, Public Library; Brighton, Public Library; Darwen, Public Library; Dumfries, Public Library; Guernsey, Guille-Alles Library; Huddersfield, Public Library; Middlesbrough, Public Library; Rhyl, Public Library; Stamford, Public Library; Shrewsbury, Public Library; Swansea, Public Library; Southend,

Public Library; Great Yarmouth, Public Library; Dublin Trinity College Library; Belfast, Queen's College Library; Leeds, University Library; Cambridge, Philosophical Library.

6. *Part II. only:*—
Royal Society of Medicine; Bradford, Public Library.

7. *Parts II. and III.* (2):—
London, Institution of Mining Engineers.

8. *Parts III.* (1) *and* (2) *and IV.*:—
London, Solar Physics Observatory.

9. *Parts III.* (1) *and IV.*:—
London, Royal Society.

10. *Part III.* (2) *only*:—
Richmond, Free Public Library; London, Science Museum, Institution of Electrical Engineers, Institution of Mechanical Engineers, Physical Society, Imperial College of Science and Technology; Cardiff, University College; Dundee, University College; Glasgow, University Library; Manchester, University.

11. *Parts II., III.* (1) (2):—
London, National Physical Laboratory.

Part I.—Weekly Weather Report with Appendices.

Weekly Summaries.—The Weekly Weather Report gives a summary of the weather of the week ending with Saturday, intended principally for agricultural and sanitary purposes.

An advance copy of the MS. of the Weekly Report is prepared on Tuesday in each week, and is supplied free of charge to newspapers.

A division of the country into twelve districts, which are identical with the forecast districts of the Daily Weather Report, is adopted. The districts are further grouped into extreme north, eastern and western districts, and extreme south (islands in the English Channel).

From the beginning of 1912 the arrangement of the tables of data was changed, and in its present form the Report contains:—

I.—General remarks on the meteorological conditions of the week, with a table describing in words the divergence of the warmth, rainfall, and sunshine experienced in each district from the average for the district for the time of the year, and further tables summarising the weekly tables for the season and the four preceding seasons.

II.—A table containing the data from stations from which the values for districts are calculated.

III.—A table giving information of the temperature of the sea-water at a selection of stations on the coasts of the British Isles.

IV.—A table summarising in numerical form the conditions of temperature, rainfall, and sunshine for each district for the week, the current season, and the calendar year.

V.—A series of maps showing the distribution of pressure, temperature, and wind over Europe, Iceland, the North Atlantic and the United States, at 7 a.m. on each day, and the temperature of the sea during the week. The maps for each day are accompanied by a brief account of the distribution of weather for that day, and the changes which have taken place.

The weekly statistical tables of values for districts have been prepared in their present form since 1878.

Since the beginning of the year 1912, the form of the maps has been entirely modified. In place of three maps for each day, a single map has been substituted. It embraces a much larger area than that covered by previous years' charts, and includes the whole of Europe, the North Atlantic Ocean north of 28° N., and a part of the North American continent as far west as the great lakes. The maps show the distribution of pressure, temperature, wind and weather at the hour of morning observation, as derived from information contained in the telegraphic reports to the Office, in the Bulletin International, already referred to (p. 63), in wireless reports from the Atlantic, and in the Canadian Daily Weather Reports.

For the statistical summaries, the information from the telegraphic reporting stations in the British Isles is supplemented by returns of daily observations supplied by volunteer observers from over 100 other stations. Of these 32 supply only the daily amounts of bright sunshine.

Appendices.—Subscribers for the Weekly Weather Report receive the following appendices :—

(*a.*) An *Appendix*, issued quarterly and annually, containing *quarterly and annual summaries of the rainfall, mean temperatures* and *bright sunshine* of each district for each of the six lustra from 1880 to 1910, and for the year 1911.

(*b.*) An *Appendix*, issued annually, giving *weekly and progressive totals* of rain-days, rainfall, accumulated temperature, and duration of sunshine with percentage of its possible amount, for the several districts.

(*c.*) An *Appendix*, issued annually, giving a summary of the *gales* experienced at anemograph stations in connexion with the Office.

(*d.*)* An *Appendix* computed every fifth year, giving the *weekly values* of the different elements in the *five years*, and for the whole period, since 1881.

(*e.*)* An *Appendix*, which is also prepared every fifth year, giving the *monthly averages* of rainfall, rain-days, maximum temperature, minimum temperature, mean temperature, duration of bright sunshine and percentage of possible bright sunshine, for as many as possible of the stations included in the Weekly Weather Report.

Part II. Monthly Weather Report and Annual Summary.

Monthly and Annual Summaries.—The Monthly Weather Report is issued as a supplement to the Weekly Weather Report. Each

* These appendices for the period ending with the lustra, 1906–1910, have not yet been issued.

number contains (1) a general account of the weather for the month; (2) a complete summary of the observations at the Telegraphic Reporting Stations, and at Normal Climatological Stations; (3) a summary of maximum and minimum temperature, temperature in the ground and on the grass, rainfall, and sunshine at auxiliary Climatological Stations; (4) the differences, where possible, from the average pressure, temperature, rainfall and sunshine; (5) four maps showing the monthly distribution of barometer and wind, the movements of barometric depressions the distribution of mean temperature, and the distribution of bright sunshine; (6) a full-page map prepared by the Director of the British Rainfall Organization from data from nearly 1,000 stations showing the distribution of Precipitation.

The number for March, 1912, contains tables of results for 262 stations, namely :—32 telegraphic stations and 91 normal climatological stations, together with a summary of temperature, rainfall, and sunshine, or one or more of these elements, at 139 other stations. For 14 of the 32 telegraphic stations summaries are given for the hours 7 a.m., 1 p.m., 9 p.m., a combination which entitles the stations to rank as normal climatological stations.

An Annual Summary on similar lines has been added since the year 1904.

Part III. Daily Readings at Meteorological Stations of the First and Second Orders.

(1.) Daily Readings.

This publication contained, up to and including 1910, daily values for 20 stations in the British Islands of observations made at stations of the second order at 9 a.m. and 9 p.m. Particulars of the headings under which observations are taken are given in Section I., page 83. The publication also contained daily summaries of the records from 12 stations equipped with autographic anemometers. It contains for 1912 daily values at 16 stations for 9 h. and 21 h. A similar publication, containing meteorological observations but no data from anemograph stations, has been issued in annual volumes since 1876. These annual volumes, up to and including 1907, contain, in addition, monthly and annual summaries for a large number of stations which are now included in the Monthly Weather Report. The prices of the volumes vary from 10*s.* 6*d.* to 35*s.*

(2.) Geophysical Journal.

This publication which commenced with January, 1911, contains daily meteorological and magnetic data for the three Meteorological Office observatories, electrical and solar data for two observatories, seismic data for Eskdalemuir and wind components for four principal anemograph stations at 3, 9, 13, 21 h. Since January, 1912, values have been published from the records of temperature, humidity, and wind, in the free atmosphere, obtained by means of kites, balloons or pilot balloons. Monthly parts, price 4*d.* each; annual volume, 5*s.*

Part IV. Hourly Values from Autographic Records at the Meteorological Office Observatories.

(1.) Meteorological Section.

This publication contains hourly values of pressure, dry bulb temperature, humidity, wind direction and velocity, rainfall and bright sunshine, for — Valencia, Kew and Eskdalemuir. Particulars of the corresponding publications for previous years are given in Section K, page 116.

(2.) Geophysical Section.

This publication contains hourly readings of the components of terrestrial magnetic force at Eskdalemuir Observatory, with diurnal inequalities for terrestrial magnetism and atmospheric potential gradient, and monthly and annual summaries of hourly values of meteorological and geophysical data at the Meteorological Office observatories and stations of the first order. It is issued annually; the first volume, giving the results for 1911, will be completed in 1912.

The data in Parts III. and IV. of the Year-book are expressed throughout in units based upon the C.G.S. System.

Unpublished Observations.

The Office also receives, in return for an annual grant, duplicates of the curves from the autographic instruments at Glasgow* and Stonyhurst* observatories, and the tabulations of these curves are available, if required, as well as the hourly tabulations of the curves from these observatories.

Anemographic records are received from Alnwick Castle, Armagh,* Brighton, Deerness,*† Dover, Dublin,* Falmouth (Pendennis Castle), Fleetwood, Gorleston, Holyhead,† Kingstown, Dwyran, The Groyne Lighthouse, South Shields, Plymouth, Pyrton Hill, Quilty, Roche's Point, Rosyth, Scilly,† Shoeburyness, South Kensington, Southport, Warlingham, and Yarmouth.†

The names of all stations in the British Isles from which information of any kind is received, and a statement of the order of the stations and of the publication for which the returns are prepared are given in the lists in Section I., p. 82. All the records are available for the use of the public on the conditions set forth on p. 59.

D.—Information from Land Stations outside the British Isles.

Foreign and Colonial Stations.—Periodical returns are received from certain stations in different British Colonies and dependencies, or in foreign countries.

A list of the stations, stating the character of the observations taken, is given in Section I., p. 82. It includes two anemometer stations, Gibraltar and St. Helena.

The information contained in these returns is available upon the same conditions as that contained in the returns of British Stations.

A summary of the observations at Gibraltar is now included in the Monthly Weather Report.

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* Results from anemographs at these stations are now published in "Daily Readings at Meteorological Stations of the First and Second Orders."

† *Results* from anemographs at these stations are now published in the "*Geophysical* Journal."

E.—The Library and Museum.

Library.—In return for copies of publications the Office receives the weather reports and other publications of the official meteorological organisations of the world, and of many private organisations. A list arranged geographically of the institutions sending periodical publications containing meteorological and magnetic data is given in Appendix VII., p. 145.

The library has also gradually acquired a large collection of pamphlets and books bearing upon meteorological subjects.

The terms on which books and documents in the library can be consulted are stated on p. 59.

Museum.—The museum of meteorological instruments, diagrams, &c., is open for inspection during office hours by permission of the Director.

F.—Supply of Instruments and Forms to Observers.

Loan of Instruments.—In accordance with the terms of the Parliamentary grant the Office does not lend instruments for the use of observers except in the following cases :—

(1.) To the Captains of vessels who undertake to keep a Meteorological log during their voyage and forward it to the Office. (*See* p. 62.)

(2.) To the Telegraphic Reporting Stations in the British Isles.

(3.) To the First Order Stations in connexion with the Office.

(4.) To selected Stations in less frequented parts of the world where observations are deemed to be specially desirable.

(5.) To a limited number (230) of fishing communities.

Supply of instruments for observers at Land Stations.—The Director is authorised to supply, at a cost of 5 per cent. in addition to the contract prices and the cost of carriage, trustworthy instruments for standard meteorological observations to those who are willing to send copies of their observations to the Office. The risk of breakage in transit must be undertaken by the consignee. The Director will also, if desired, give advice about the site and exposure of the instruments.

Supply of forms.—Forms for recording the observations, and tables for reducing them, are supplied to observers for the Office free of charge. The postage of returns, addressed to the Director of the Meteorological Office, need not be prepaid.

Blank sunshine cards are supplied without charge to a number of stations, not exceeding 10 in each district (including official stations), on condition that the cards are returned to the Office for filing. In other cases, cards are supplied, at a special price, to observers contributing returns. Forms for other self-recording instruments are supplied to a limited number of observers free of cost, provided that the records are deposited with the Office and that the forms required are of a type kept in stock by the Office for use at Official Stations.

For further information as to the supply of instruments, forms, &c., application should be made to the Office.

Fishery Barometers.

The Office possesses a number of Barometers which it lends for the use of fishing communities, where it is shown that the instrument will be of material service. As a condition of the loan the community is required to provide for the housing of the instrument and to keep and forward to the Office a record of daily readings.

A copy of a manual specially compiled for the purpose accompanies the instrument, and is intended to point out in simple language the practical use of the Barometer, with a view to anticipating important changes in the weather in the neighbourhood of the fishing stations. The following is a list of stations that have been supplied with Fishery Barometers :—

List of Stations supplied with Fishery Barometers.

Shetland Isles.—Uya Sound, Burravoe, Nesting, Lerwick, Sandwick, Scalloway, Symbister, Hamnavoe, Walls.

Orkney Isles.—Westray, Papa Westray, Burray, Kirkwall, Barswick.

Scotland, East coast.—Duncansbay, Freswick, Auchengill, Keiss, Ackergill, Staxigoe, Wick, Lybster, Dunbeath, Hilton, Inver, Portmahomack, Ballintore, Cromarty, Avoch, Nairn, Burghead, Portessie, Port Knockie, Portsoy, Whitehills, Gardenstown, Rosehearty, Pitullie, Fraserburgh, Inverallochy, Pointlaw, Portlethen, Skateraw, Stonehaven, Arbroath, Broughty Ferry, St. Andrews, Crail, Cellardyke, St. Monance, Burntisland, Newhaven.

England, East coast.—Berwick, Blyth, North Shields, South Shields, Sunderland (Roker), West Hartlepool, Staithes, Scarborough, Filey, Flamborough, Bridlington Quay, Withernsea, Hull, Lynn (2), Wells, Gorleston, Lowestoft, Walberswick, Harwich, Brightlingsea, West Mersea, Maldon, Leigh, Margate, Deal, Kingsdown, Dover.

England, South coast.—Bognor, Ryde, Bembridge, Brixton, Atherfield, Ventnor, Yarmouth (Isle of Wight), Poole, Weymouth, Portland.

Channel Islands.—Gorey (Jersey).

England, South-West coast.—Budleigh Salterton, Exmouth, Ca[w]sand, Mevagissey, Gorranhaven, Devoran, Portscatho, Penr[yn], Durgan, Porthallow, Falmouth, Coverack, Newlyn (2), Mousehole, Penberth Cove, St. Ives, Hayle, Port Isaac, Bideford, Burnham, Highbridge, Weston-super-Mare.

Wales.—Briton Ferry, Swansea, Angle, Milford, Aberystwyth, Carnarvon.

England, North-West coast.—Fleetwood, Morecambe, Maryport.

Isle of Man.—Douglas, Port St. Mary, Peel (2).

Scotland, South-West coast.—Port Patrick, Cairn Ryan, [Port] William.

Ireland, East coast.—Belfast, Bangor, Groomsport, Portaferry, Donaghadee, Ballyhalbert, Cloghy, Ardglass, Carlingford, Glen, Greenore, Dundalk, Lough Shinny, Clogher Head, Malahide, Howth, Kingstown (2), Bray, Wicklow, Rosslare.

Ireland, South coast.—Dunmore East, Dungarvan, Kinsale, Union Hall, Castletownshend, Baltimore, Schull (2), Crookhaven, Castletown (Berehaven), Lawrence Cove, Ballydonegan, Ballycrovane.

Ireland, West coast.—Valencia, Dingle, Tralee, Kilronan, Galway, Spiddal, Cleggan, Elly Bay, Ballyglass, Ballycastle (Co. Mayo), Mullaghmore, Donegal, Tribane, Killybegs, Teelin, Malinmore, Port Noo, Burton Port, Kincashla, Bunbeg, Inniscoo Island.

Ireland, North coast. — Dunfanaghy, Rathmullen, Buncrana, Malin Head, Moville, Greencastle, Port Stewart, Portrush, Port Ballintrae, Ballintoy, Ballycastle (Co. Antrim).

Scotland, West coast.—Lamlash, Tarbert (Loch Fyne), Loch Ranza, Campbeltown, Carradale; Portnahaven, Port Wemyss, Gruinard, and Bowmore (Islay); Mallaig; Portree and Armadale (Isle of Skye); Isle of Soay, Kyle of Lochalsh, Plockton, Ardneaskan, Shieldaig, Badachro, Ullapool, East Mey, Gills, Stroma (2).

Hebrides.—Ness, Carloway, Marvaig, Crossbost, Stornoway, Portnaguran, Valtos, Obb, Bernera, Boreray, Lemreway, Loch Boisdale.

G.—Publication of Observations contributed by Volunteer Observers or by the Representatives of Local Authorities.

I. General Regulations.—(*a.*) The observations must in all cases be taken by a competent observer, from approved instruments, satisfactorily exposed. Approval of the instruments and exposure is subject to periodical inspection by the Office.

Regularity in taking the observations and dispatching the reports is essential.

(*b.*) The sunshine cards upon which returns have been based must be sent to the Meteorological Office for examination at the close of each month. Cards supplied to observers at the special price referred to on p. 77 will be returned after examination.

(*c.*) The Director reserves the right to discontinue at any time, temporarily or permanently, the incorporation in the Official reports of information received from any station.

(*d.*) Observers contributing to one of the publications issued by the Office receive an official copy of the publication. It is requested that these copies may be filed in a public library or similar institution, or be returned to the Office when the observer has no further personal use for them.

II. Publication in the Daily Weather Report.—For publication in the Daily Weather Report, the information must be in accordance with one of the forms here specified:—

(*a*) **Full Telegraphic Report at 7 a.m.**—A complete record of barometer, temperature, wind, &c., based upon observations made at 7 a.m., and at 6 p.m. of the previous day, and telegraphed each morning in time to reach the Office not later than 9 a.m. This information must be sent in code, a copy of which, with other necessary instructions, will be supplied by the Office. A manuscript copy of the observations on a form provided for the purpose must be sent at the end of each month.

(*b.*) **Telegraphic Report at 6 p.m.**—*See* V.

(*c.*) **Postal Report at 9 p.m.**—A post card (Form 231) reporting observations taken at 9 p.m. of maximum and minimum temperature, and rainfall for the 24 hours ended at 9 p.m., and the duration of bright sunshine, together with brief notes on the general character of the weather during the day. Space is also provided on the cards for the entry of the remaining observations (barometer, wind, &c.), made at a normal climatological station at 9 p.m. This report can only be accepted if the postal arrangements are such that the card will be delivered at the Meteorological Office by 10 a.m. on the following morning if it be posted immediately after the observations have been taken.

III. Publication in the Weekly Weather Report.—Observations are accepted from a limited number of stations for publication in the Weekly Weather Report. The information should consist of observations taken once daily of the maximum and minimum temperature and of the rainfall, together with the duration of bright sunshine, and brief notes on the weather of each day.

Observations of the minimum temperature on the grass, and of underground temperature at the depths of 1 foot and 4 feet are also included. Each return should be posted as soon as possible after the Sunday morning reading, in order that it may reach London by Monday.

IV. Publication in the Monthly Summary of the Weekly Weather Report, and in the Monthly Issue of Daily Readings at Meteorological Stations of the First and Second Orders. For this purpose a monthly return must be sent so as to reach the Office *not later than the 10th* of the following month. Three forms of return are at present in use. In Form 355 provision is made for the complete set of observations made at a normal Climatological Station at which observations are recorded three times a day. Form 347 is similar to Form 355, but provision is made for the entry of observations made twice a day only. Form 348 is similar, but for one hour of observation only.

V. Publication in the Evening Reports circulated to the Newspaper Press.—Arrangements have been made for the issue to the Press of a daily report embodying the information received by telegraph from health resorts. The observations included in these schedules comprise the amount of bright sunshine and the maximum temperature for the day, the minimum temperature and the amount of rainfall for the 24 hours ended at 6 p.m., and, further, the observations of the barometer, wind, temperature and weather recorded at 6 p.m. This statistical information is supplemented by brief notes regarding the general character of the weather or any exceptional phenomena such as thunderstorms, unusually heavy rainfall, &c.

The schedules are issued to the press on the same terms as other reports of the Office, *i.e.*, they are supplied free of charge to the messengers of all newspapers and news agencies that call for them. They are ready for delivery at 7.15 p.m.

The reports from contributing stations must be sent in code form in time to reach the Office not later than 7 p.m. The inclusion of observations is conditional upon annual inspection of the station by a representative of the Office. For this service a fee of £4 is charged. The sunshine cards upon which the records of bright sunshine are based must be sent to the Meteorological Office for

examination at the close of each month. A manuscript copy of the observations must be sent on one of the forms described on p. 80, at the end of each month.

The cost of telegraphy must be borne locally.

The information regarding maximum and minimum temperature, sunshine and rainfall contained in the 6 p.m. telegrams is included in the following day's issue of the Daily Weather Report.

NOTE.—At auxiliary climatological stations, for which extremes of temperature and rainfall amounts for the 24 hours ending at 9 a.m. are required, as well as the data referred to in the messages dispatched at 6 p.m., separate minimum thermometers and raingauges should be provided for the two sets of observations. A single maximum thermometer will suffice, if the instrument be read, but not *set*, at 6 p.m. At normal climatological stations, when the extremes used for climatological purposes should be for the 24 hours ending 9 p.m., a double set of instruments is not required if both thermometers are *set* only once a day, viz., at 9 p.m.

H.—REGULATIONS FOR THE SUPPLY OF INFORMATION FROM INSTRUMENTS BELONGING TO THE METEOROLOGICAL OFFICE BY THE CUSTODIANS OF THE INSTRUMENTS.

The custodians of instruments maintained by the Meteorological Office are not allowed to supply information derived from the instruments in their charge without previous permission obtained from the Director.

Permission is not given when the information required can be obtained directly from the Office in the course of post. Applicants for information should in that case be referred to the Office.

In special circumstances the Director will give permission for information to be extracted by the custodian for the use of Local Authorities, provided—

(1) That a note shall be appended to the information thus supplied to the effect that "The information is derived from instruments belonging to the Meteorological Office, and is subject to correction or modification";

(2) That if the information be published, the note shall also be published;

(3) That a copy be kept of the information supplied, to be forwarded to the Meteorological Office if required.

If arrangement is made for the payment of the custodian for this service the Director must be informed.

In cases in which the extraction of provisional information is permitted, instructions for observing or tabulating will be given to the custodian, which must be strictly followed.

I.—OBSERVATORIES AND STATIONS IN CONNEXION WITH THE METEOROLOGICAL OFFICE.

Central Observatory.

Kew Observatory, Old Deer Park, Richmond, Surrey.

Superintendent: C. Chree, LL.D., Sc.D., F.R.S., *Assistant Director of Observatories.*

Telegraphic Address: "Weather, Richmond, Surrey."

Magnetic Observatory.

Eskdalemuir Observatory, Langholm.

Superintendent: G. W. Walker, M.A.

Western Observatory.

Valencia Observatory, Cahirciveen, Ireland.

Superintendent: J. E. Cullum.

Kew Observatory was built in 1769 as a private observatory an[illegible] an astronomical and physical laboratory for King George III. Th[illegible] building was placed at the disposal of the British Association [illegible] 1842 and taken over by the Royal Society of London in 1871. Th[illegible] Observatory formed a department of the National Physic[illegible] Laboratory from 1900 to 1910, and passed under the manageme[illegible] of the Meteorological Office from July 1, 1910. Besides the wo[illegible] of a normal meteorological observatory (station of the first ord[illegible] of the international classification), the observatory undertakes e[illegible] perimental and research work in Meteorology, including Atmosphe[illegible] Electricity, Terrestrial Magnetism and Seismology.

Eskdalemuir Observatory was established by Government to continue the work of recording the magnetic elements which had been carried on at Kew Observatory and had been disturbed by electric tramways. It was opened in 1908. The work of the observatory includes routine work and experimental research in Terrestrial Magnetism, Atmospheric Electricity and Meteorology, as well as the maintenance of several Seismographs.

Valencia Observatory was established by the Meteorological Office in 1867 on Valencia Island. In 1891 it was transferred to Westwood House, Cahirciveen. Besides the work of a First Order Station and a Telegraphic Reporting Station, regular observations of magnetic force are made by arrangement with a committee organised by the late Earl of Rosse.

Other stations in connexion with the Office are shown in the list which follows.

The returns from stations marked "§" are supplied by the Scottish Meteorological Society. Stations marked "S" are in connexion with the Society as well as with the Office.

The list shows the order of classification of the stations and also the publication for which the returns are prepared in the Office.

ıpecifying the order of the station a distinction has been drawn ween eye observations and the records of autographic instruıts. In general the returns received have formed the basis for classification, but in cases in which more extensive observations taken, but not forwarded to the Office, the corresponding ıbol has been enclosed in brackets. The list makes no pretence completeness in respect of these. The symbols used are lained as follows :—

I. Normal Meteorological Observatory : Station of the First Order.—Continuous records or hourly readings of pressure, temperature, wind, sunshine, and rain, with eye observations of the amount, form, and motion of the clouds, and notes on the weather. The autographic records are checked by frequent eye observations, and hence the symbol "I" has been entered in the table under both "Eye observations" and "Autographic."

II. Normal Climatological Station : Station of the Second Order.—Daily observations at 9 a.m. [3 p.m.] and 9 p.m. local time (or other accepted combinations of hours) of pressure, temperature (wet and dry-bulb), wind, amount of cloud, and weather, with the daily maximum and minimum of temperature, the daily rainfall, and remarks on the weather. Stations at which the additional observation at 3 p.m. is taken are distinguished by appending a suffix $_3$ to the symbol, thus—II_3.

II. Auxiliary Climatological Station : Station of the Third Order.—Observations similar in kind to those at the Normal Stations, but either (*a*) less full, (*b*) taken only once daily, (*c*) taken at hours other than 9 a.m. and 9 p.m.

T. Telegraphic Reporting Station.—Daily observations at 7 a.m., 1 p.m., and 6 p.m. G.M.T., similar in general character to those taken at Normal Climatological Stations, reported to the Office each day by telegraph. At some telegraphic stations an additional observation is taken at 9 p.m., and as the combination of hours 7 a.m., 1 p.m., 9 p.m. is accepted as suitable for stations of the Second Order of the international classification, these stations are distinguished by the two symbols T II_3.

●. (Eye Observations.) Additional Rainfall Station.—Daily observations, generally at 9 a.m., of the amount of rainfall.

✓. Additional Anemograph Station.—Continuous records of wind velocity (force) and, in most cases, also of wind direction.

B. Additional Barograph Station. — Continuous record of atmospheric pressure.

Θ. Additional Thermograph Station.—Continuous record of atmospheric temperature.

●. (Autographic.) Additional Autographic Rain-gauge Station.—Continuous record of rainfall.

H. Hygrograph Station.—Continuous record of the relative humidity of the air.

⊙. Sunshine Station.—Continuous record of bright sunshine taken with a Campbell-Stokes recorder.

K. Kite or Balloon Station.—Records of Temperature, Humidity and Wind in the upper air.

The publications for which the returns are prepared are indicated by the following letters :—

D. Published *in extenso* in the "Daily Weather Report."

d. Published in abridged form in the "Daily Weather Report."

W. Weekly summary of temperature and rainfall and, if available, of sunshine, published in the "Weekly Weather Report," (British Meteorological and Magnetic Year Book. Part I.).

w. Weekly summary of bright sunshine only, or of grass minimum, or earth temperatures, published in the "Weekly Weather Report," (British Meteorological and Magnetic Year Book. Part I.).

M. Full monthly summary in the international form published in the "Monthly Weather Report," (British Meteorological and Magnetic Year Book. Part II.).

m. Abridged monthly summary published in the "Monthly Weather Report," (British Meteorological and Magnetic Year Book. Part II.).

(m.) Monthly totals of bright sunshine only or of rainfall only published in the "Monthly Weather Report," (British Meteorological and Magnetic Year Book. Part II.).

S. Daily values published in "Daily Readings at Meteorological Stations of the First and Second Orders," (British Meteorological and Magnetic Year Book. Part III Section 1).

𝒜. Daily summary of anemometer results certain of which are published in "Daily Readings at Meteorological Stations of the First and Second Orders," (Part III., Section 1 of the British Meteorological and Magnetic Year Book) Or in the "Geophysical Journal," (Part III., Section 2 of the Year Book).

k. Values for the upper air obtained by kites, pilot balloons and registering balloons, published in the Geophysical Journal, (British Meteorological and Magnetic Year Book. Part III. Section 2).

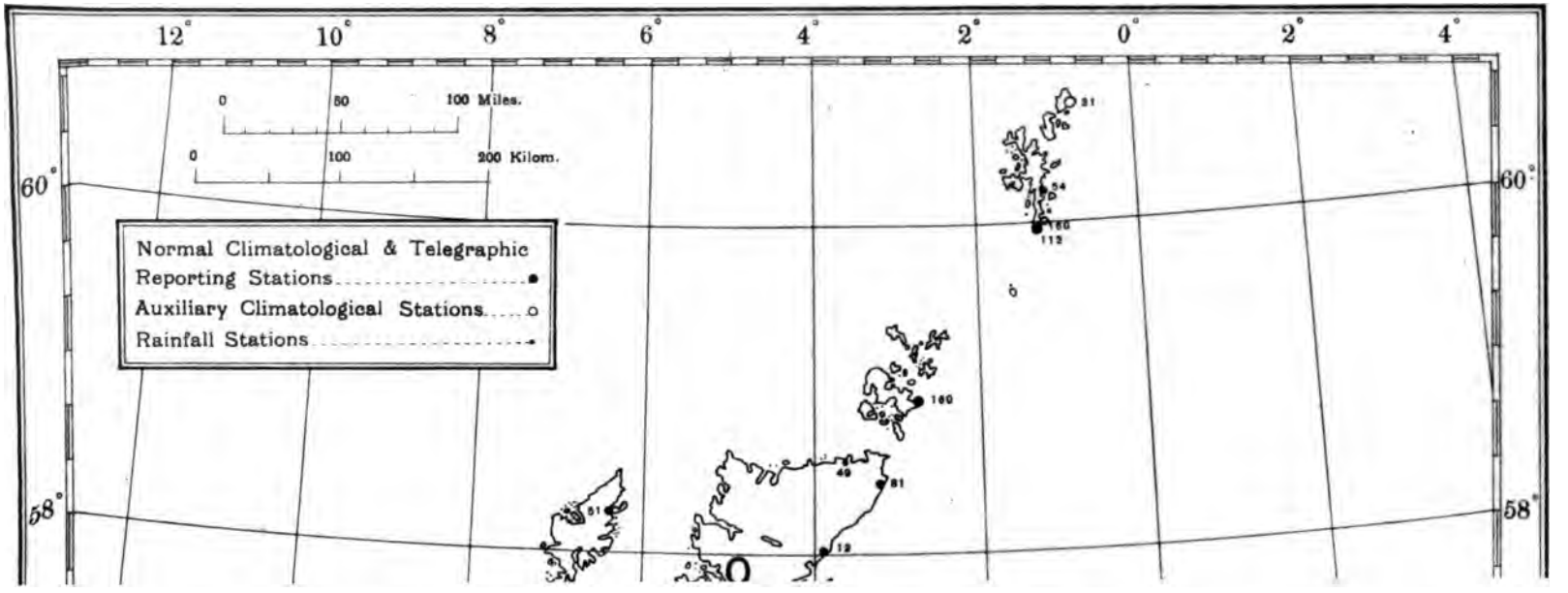
H_1. Hourly readings of pressure, temperature, wind, rainfall humidity and sunshine published in the British Meteorological and Magnetic Year Book. Part IV. Section 1.

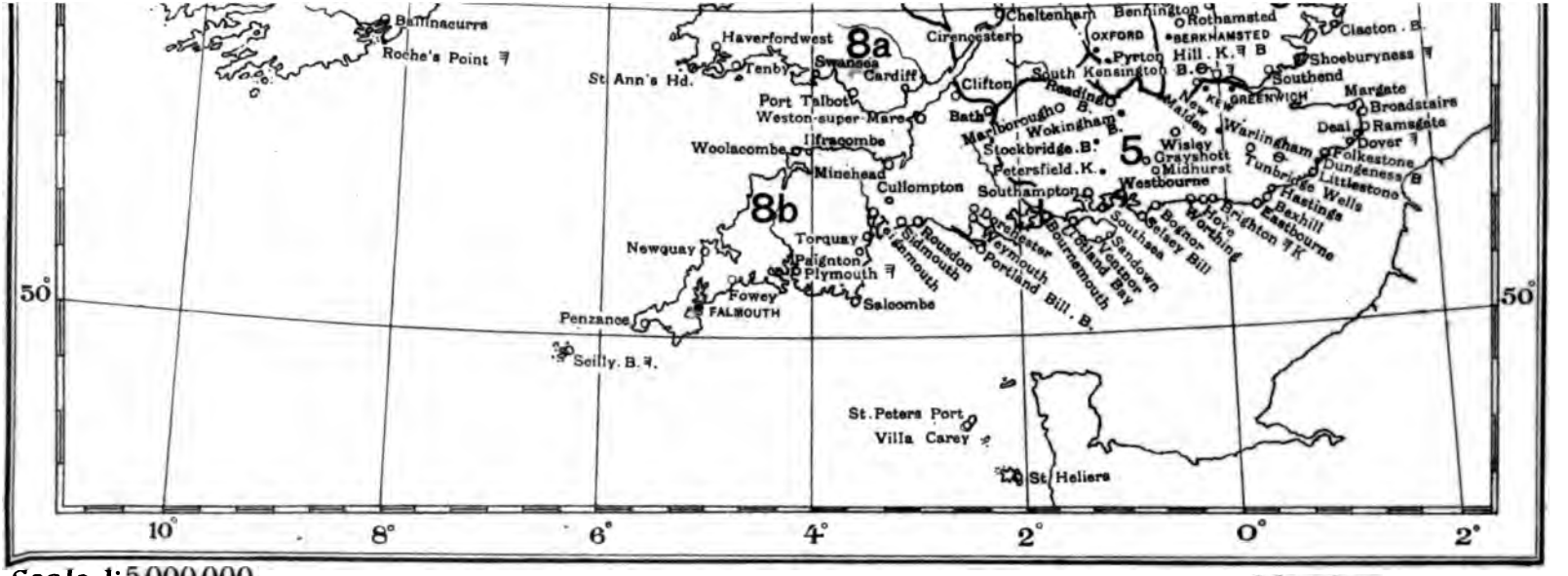
H_2. Hourly readings of the components of terrestrial magnetic force or diurnal inequalities of magnetic components and electric potential gradient, published in hourly values from autographic records—geophysical Section, (British Meteorological and Magnetic Year Book. Part IV Section 2).

Fig. 2 between pp 84 and 85.

REPORT OF THE METEOROLOGICAL COMMITTEE 1911-1912.

Map showing Positions of Climatological Stations.





Scale 1:5,000,000.

Ordnance Survey, Southampton 1912.

The Stations in the London District are not all shown.

h. Hourly summaries of pressure, temperature, wind, rainfall, humidity and sunshine for each month and for the whole year, published in hourly values from autographic records—geophysical Section, (British Meteorological and Magnetic Year Book. Part IV. Section 2).

R. Monthly summary published in the Reports of the Registrar General of Births, Deaths, and Marriages for Ireland.

r. Weekly summary published in the Reports of the Registrar General for England and Wales, or for Ireland.

Height above Mean Sea Level.—The figures given in this column refer in general to the height of the ground on which the rain-gauge stands. At those stations which do not possess a rain-gauge, the figures refer to the height of the particular instrument in use.

The positions of the climatological and rainfall stations may be identified on the map, Fig. 2, p. 84, from the figures which give their heights above Mean Sea Level, as shown in the following list.

*** From a number of stations in the British Isles printed summaries of observations are received. These have been included in the Geographical list of Institutions, &c., which issue publications (Appendix VII. to the Annual Report of the Meteorological Committee).

The following make monthly returns in a form similar to that in which observations are received from the normal or auxiliary climatological stations :—

Bolton.—The Museums and Meteorological Observatory.
Croydon.—Natural History Society.
Northampton.—Natural History Society.
Truro.—Cornwall County Council Sanitary Committee.

List of Stations arranged according to Districts and Counties.

The Counties are grouped in Districts which are numbered as follows :—

0. Scotland, N. { (*a*) Islands. (*b*) Mainland.
1. Scotland, E.
2. England, N.E. { (*a*) Northern Part. (*b*) Southern Part.
3. England, E. { (*a*) Northern Part. (*b*) Southern Part.
4. Midland Counties { (*a*) Eastern Part. (*b*) Western Part.
5. England, S.E. London County.
6. (*a*) Scotland, W., and (*b*) Isle of Man.
7. (*a*) England, N.W., and (*b*) North Wales.
8. (*a*) South Wales and (*b*) England, S.W.
9. Ireland, N. { (*a*) Western Part. (*b*) Eastern Part.
10. Ireland, S. { (*a*) Eastern Part. (*b*) Western Part.
11. English Channel (Western Section).

County and Station.		Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
					Eye Obs.	Autographic.			
0. SCOTLAND, NORTH.*									
(a.) *Islands.*									
Hebrides :—	Castlebay, Barra Isle ...	° ′ 56 57	° ′ 7 29 W.	37	T II,	B ⊙	D.W.M.	11	J. Smith, for M.O.
	Glendrynoch, Skye ...	57 18	6 17 W.	—	●	—	—	—	Rev. H. Harbord.
	Stornoway	58 11	6 22 W.	51	T II,	B ⊙	D.W.M.	11	W. Grant, for M.O.
Shetlands :—S.	Baltasound	60 44	0 48 W.	31	III	⊙	W.m.	11	T. Edmonston Saxby, F.R.C.S., Ed.
	Dunrossness ...	59 51	1 17 W.	160	II	—	m.	—	Rev. W. Fotheringham.
	Lerwick	60 9	1 8 W.	—	—	B	—	09	G. Gray, Harbour Master.
	Lerwick	60 9	1 8 W.	54	T II,	B	D.W.M.	11	Coastguard, for M.O.
	Sumburgh Head ...	59 51	1 17 W.	112	T II,	B	D.W.M.	10	Rev. W. Brand, for M.O.
Orkney :—	Deerness	58 56	2 45 W.	160	II	⊙	w.M.S.	11	M. Spence.
(b.) Mainland.									
Caithness :—	Reay	58 34	3 48 W.	49					Rev. D. Carmichael.
	Wick	58 27	3 6 W.	81	T II,	B			M.O.

					II				M.B.
Inverness :—	*Fort Augustus* ...	57 8	4 40 W.	68	II	⊙	W.M.	11	Rev. C. von Dieckhoff, O.S.B. and Rev. Ambrose Geoghegan, O.S.B.
	Fort William	56 49	5 7 W.	175	II	—	W.M.S.	11	W. T. Kilgour.
	Kingussie	57 5	4 2 W.	822	II	—	M.	11	W. de Watteville, M.D.
	Lochboisdale	57 10	7 20 W.	—	—	B	—	—	Arch. Maclennan.
Ross :—	Ardross Castle	57 45	4 21 W.	449	●	—	—	—	W. Laing Minty.
	S. Fortrose	57 35	4 8 W.	79	III	⊙	m.	10	Archd. Thom, M.A.
	Glencarron	57 30	5 14 W.	500	II	—	W.M.	10	D. D. Munro.
	Kinlocheive	57 36	5 24 W.	78	●	—	—	—	A. McLennan, for Hon. W. Peel, M.P.
Sutherland :—	Dunrobin Castle ..	57 59	3 56 W.	12	II	—	M.	09	D. Melville, for the Duke of Sutherland, K.G.
	1. SCOTLAND, EAST.								
Aberdeen :—	Aberdeen Observatory	57 10	2 6 W.	46	I, T	I, B	D.W.M.S.h.	11	Professor C. Niven, F.R.S., and G. A. Clarke, for M.O.
	Balmoral	57 2	3 12 W.	920	III	—	W.M.	11	J. Michie, M.V.O., and John M. Troup.
	Braemar	57 0	3 24 W.	1,113	II	—	M.	—	A. M. Shirran.
	Dyce	57 13	2 10 W.	149	●	—	—	—	James E. Crombie, LL.D.
	Insch	57 20	2 37 W.	426	II	⊙	m.	11	J. Bisset.
Banff :—	Gordon Castle	57 37	3 5 W.	101	II	⊙	W.M.	11	C. Webster, for the Duke of Richmond and Gordon, K.G.
Berwick :—	Marchmont	55 44	2 25 W.	498	II	⊙	W.M.	10	J. A. Wood, for Sir J. H. Hume Campbell, Bart.
Clackmannan :—	No station.								
Edinburgh :—	Edinburgh, Royal Observatory.	55 57	3 12 W.	441	—	◢	—	—	The Astronomer Royal.
	Leith	55 58	3 10 W.	18	T	B	D.W.M.	11	D. Drummond and R. M. Hendrie, Post Office, for M.O.
Elgin :—	No station.								
Fife :—	Rosyth (H.M. Dockyard).	56 3	3 23 W.	—	●	◢ ●	—	—	The Superintending C.E.

* *Note.*—The parts of this district forming section (*a*) Islands, include the Shetlands, the Orkneys, and the Hebrides. The latter form part of the counties Inverness and Ross.

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List of Stations arranged according to Districts and Counties—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Autographic.			
1. SCOTLAND, EAST—*cont.*								
Forfar :— S. Balruddery	° ′ 56 29	° ′ 3 8 W.	276	III	⊙	w.m.	10	G. Davie, for J. Martin White.
Carnoustie	56 30	2 42 W.	39	III	⊙	m.	11	P. Sinclair, C.E.
§Dundee	56 28	2 56 W.	160	II	—	M.S.	09	J Carnochan.
Haddington :—No station.								
Kincardine :— S. Crathes	57 3	2 25 W.	140	III	⊙ ⊖ B	w.m.	11	J. Smith.
Stonehaven	56 58	2 13 W.	186	III	⊙	d.m.	11	J. Hart, for Town Clerk.
Kinross :— No station.								
Linlithgow :— No station.								
Nairn :— Nairn	57 36	3 52 W.	82	T	⊙	D.W.M.	11	Miss Penny, for M.O. and Medical Officer of Health.
Peebles :— S. West Linton	55 45	3 4 W.	800	III	⊙	W.M.	11	Rev. J. S. Begg.
,, (Kettle Hill)								
Perth :— §Crieff	56 22	3 50 W.	440	II	—	W.M.	10	George Reid, for Dr. Meikle.
Forgandenny	56 21	3 29 W.	175	—	B ●	—	—	Miss Frances Wood.
Roxburgh :— No station.								
Selkirk :— No station.								
2. ENGLAND, NORTH EAST.								
(a) *Northern Part.*								
Durham :— Chopwellwood ...	54 55	1 47 W.	445	III	⊙	m.	11	J. F. Annand.
Durham	54 46	1 35 W.	336	II	⊙	W.M.	09	F. C. H. Carpenter, M.A.
Ushaw College ...	54 47	1 39 W.	599	III	—	m.	—	Rev. C. Gelderd.
Northumberland :— Allan's Green ...	54 59	2 20 W.	1,000	●	—	—	—	J. B. Lowe.
Alnwick Castle ...	55 25	1 43 W.	210	III	⊙	W.m.	11	Robert Kyle, for the Duke of Northumberland, K.G.
Bellingham	55 13	2 18 W.	848	III			,,	C. O. Mortimer Bell.

										for the Northumberland County Council.
	Font Watershed, Dam Site.	55 14	1 54 W.	620	●	—	—	—		H. G. Coventry, C.E., for the Corporation of Tynemouth.
	Heddon-on-the-Wall...	55 0	1 47 W.	400	●	—	—	—		Rev. W. G. Pringle.
	Newcastle (Pendower).	55 0	1 36 W.	—	—	⊙	w.	—		Mrs. H. M. Pease.
	Newcastle-on-Tyne ...	54 59	1 36 W.	152	III	⊙	w.m.	10		N. H. Martin, F.R.S.E., F.C.S.
	North Shields ...	55 0	1 27 W.	96	T	B	D.W.M.r.	11		R. Moat, Post Office, for M.O.
	South Shields ...	55 0	1 26 W.	—	—	◢	—	11		J. McDonald Manson, for the Tyne Improvement Commission.
	Tynemouth	55 1	1 26 W.	90	II_2	⊙	d.m.	09		J. Edward Burnett.
Yorkshire, N. Riding :—	Ampleforth	54 12	1 6 W.	349	II	—	m.	09		Rev. T. I. Barton, O.S.B., and Rev. R. C. Hesketh, O.S.B.
	Hovingham Hall ...	54 10	0 59 W.	120	●	—	—	—		Bingley Day, for Sir W. H. A. Worsley, Bart.
	Rounton	54 24	1 18 W.	249	II	—	W.M.	11		J. Hanagan, for Sir Hugh Bell, Bart.
M.	Scarborough	54 18	0 24 W.	100	II	⊙	d.W.M.	11		John Knight, M.D., D.P.H., for the Corporation.
	West Witton ...	54 11	1 54 W.	605	III	—	W.m.	—		J. B. Espiner.
	Whitby	54 29	0 37 W.	88	II	⊙	M.	10		Thos. Newbitt, for the Literary and Philosophical Society.
	York, Deighton Grove	53 54	1 3 W.	38	●	—	—	05		Miss M. L. Whitehead.
	„ The Museum ...	53 57	1 5 W.	56	II	—	W.M.r.	10		Oxley Grabham, M.A., for the Yorkshire Philosophical Society.
	„ Bootham ...	53 57	1 5 W.	105	—	⊙	W.M.r.	07		Hugh Richardson, M.A.
Yorkshire, E. Riding :—	Bridlington (Grammar School).	54 5	0 13 W.	56	III	(B) ⊙	—	08		A. Thornton, M.A.
	Hull	53 45	0 16 W.	12	II	⊙	M.r.w.	11		H. B. Witty, for the Corporation.
	Spurn Head	53 34	0 7 E.	26	T	B	D.W.M.	11		Principal Lightkeeper, for M.O.

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List of Stations arranged according to Districts and Counties—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Autographic.			
2. ENGLAND, NORTH EAST—*cont.*								
(b) *Southern Part.*								
Lincolnshire :—Claypole	53 2	0 46 W.	70	●	—	—	—	Rev. F. Hamilton.
Fulbeck	53 8	0 37 W.	180	III	B ⊙	W.m.	10	Rev. Vere F. Willson, M.A., and W. V. R. Fane.
Lincoln...	53 14	0 33 W.	58	III	—	W.M.	11	W. Barr. for the Corporation.
Mareham-le-Fen ...	53 8	0 5 W.	10	●	—	—	01	Mrs. G. L. Kime.
Rauceby Hall... ...	53 0	0 29 W.	124	III	⊙	w.m.	09	J. Hope, for *the late* General Sir M. Willson, K.C.B.
Skegness	53 9	0 21 E.	12	III	⊙	d.w.M.	10	S. Coetmore Jones, for the District Council.
Temple Bruer... ...	53 4	0 30 W.	?	●	—	—	03	Miss Alice S. Morley.
3. ENGLAND, EAST.								
(a) *Northern Part.*								
Norfolk :— Cromer	52 56	1 17 E.	196	II	⊙	W.M.	10	W. H. Archer, for Urban District Council.
Geldeston	52 28	1 31 E.	37	II	⊙ (B ⊖)	W.M.	09	E. T. Dowson.
Hillington	52 48	0 33 E.	88	II	⊙	W.M.	11	*The late* Rev. H. E. B. Ffolkes, M.A.
Norwich	52 37	1 17 E.	93	III	—	W.r.m.	11	A. W. Preston.
Norwich (Southwell)	52 42	1 20 E.	109	III	⊙	M.	—	J. H. Willis.
Thetford	52 25	0 45 E.	169	●	—	—	—	E. S. Greenwood, for Town Council.
Yarmouth	52 37	1 43 E.	17	T, II,	B ⊙	D.W.M.	11	Coastguard, for M.O. and for Corporation.
„ Gorleston ...	52 35	1 43 E.	10*	—		—	11	
(b) *Southern Part.*								
Bedford :— Aspley Guise	52 1	0 38 W.	410	—	⊙	m.	—	Mrs. Dymond.
Woburn, Ridgmont ...	52 1	0 36 W.	291	II	—	M.	11	H. M. Freear, F.C.S., for the Royal Agricultural Society.
						W.M.S.	10	

	" Newnham Coll.	*52 18*	*0 5 E.*	*—*	*III*	*H*	—	10	Miss Stephen.
Essex :—	Clacton-on-Sea	51 47	1 9 E.	54	T, II_2	⊙ B	D.W.M.	11	A. W. Shadick, for Urban District Council.
	Chelmsford	51 45	0 28 E.	135	III	—	m.	—	Dr. Thresh.
	Halstead	51 57	0 38 E.	139	III	—	m.	—	E. T. Adams, F.R.A.S.
	Shoeburyness	51 32	0 47 E.	18†	III	—	W.m.	11	The Superintendent of Experiments.
	Southend-on-Sea ...	51 32	0 43 E.	90	III	⊙	w.m.	10	E. J. Elford, for the Corporation.
	" Waterworks	51 32	0 43 E.	110	● (8)	—	—	10	E. C. Bilham.
	South Hanningfield	51 39	0 31 E.	—	●	—	—	—	Walter Hill.
	Stifford	51 30	0 18 E.	73	●	—	—	—	Miss A. L. Scott.
Hertford :—	Bennington	51 54	0 5 W.	406	II	—	M.	09	*The late* Rev. J. Dunne Parker, LL.D., and Miss Parker.
	Berkhamsted	51 46	0 34 W.	400	II	⊙ (I)	M.	09	E. Mawley.
	Hemel Hempstead...	51 46	0 27 W.	536	III	—	m.	—	Elliott Kitchener, M.A.
	Offley Vicarage ...	51 56	0 21 W.	523	●	—	—	—	Rev. E. P. Gatty.
	Rothamsted	51 48	0 22 W.	424	III	⊙	W.m.	09	The Director, Lawes Agricultural Trust.
Huntingdon :—	No station.								
Middlesex :—	*Harefield*	51 36	0 29 W.	337	●	—	—	—	G. Eland.
	Wembley	51 33	0 17 W.	130	●	—	—	—	A. B. Johnson.
Suffolk :—	Brandon	52 27	0 37 E.	48?	●	—	—	—	Lt.-Col. B. Spragge, D.S.O.
	Felixstowe	51 58	1 22 E.	10	III	⊙	d.W.m.	10	Montague Humphrey, for the District Council.
	Lowestoft	52 29	1 45 E.	83	II	⊙	w.d.M.	11	C. W. Edwards, for the Corporation.
	4. MIDLAND COUNTIES.								
	(a) *Eastern Part.*								
Buckingham :—	Beaconsfield	51 36	0 38 W.	360	●	—	—	—	C. T. Marcon, M.A.
	Butler's Cross ...	51 46	0 47 W.	399	●	—	—	—	G. Eland.
	High Wycombe ...	51 37	0 45 W.	—	III	—	—	—	R. O. Matthews.
	Winslow	51 57	0 53 W.	379	III	—	m.	10	R. A. Easton.

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* Head of Anemometer 52 ft. above M.S.L. † Head of Anemometer 103 ft. above M.S.L.

List of Stations arranged according to Districts and Counties—*continued.*

County and Station.		Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
					Eye Obs.	Autographic.			
4. MIDLAND COUNTIES—*cont.*									
(a) *Eastern Part*—cont.									
Derby:—	Belper	53 1	1 29 W.	222	III	—	m.	—	W. W. Tunnicliffe, B.Sc., F.C.S.
	Belper (Quarry Bank).	53 2	1 29 W.	280	II	—	m.	—	John Hunter.
	Buxton	53 16	1 55 W.	987	II_2	⊙ (B)	d.W.M.	11	W. Pilkington.
	Chatsworth	53 14	1 37 W.	—	III	B θ	—	02	J. P. Cockerell, for the Duke of Devonshire, K.G.
	Derby	52 55	1 29 W.	208	—	B	—	—	John Stretton.
	Matlock	53 7	1 30 W.	636	III	⊙	m.	—	J. D. Evans.
Leicester:—	Belvoir Castle	52 54	0 47 W.	259	II	⊙	M.	09	W. H. Divers, for the Duke of Rutland, K.G.
	Syston	52 43	1 5 W.	178	●	—	—	96	S. K. Daniels.
Northampton:—	Great Billing	52 16	0 50 W.	273	●	—	—	—	Rev. G. H. Mullins, M.A.
	Oundle (The School)...	52 29	0 28 W.	144	III	⊙	—	04	F. W. Sanderson, M.A., Headmaster.
	„	52 29	0 28 W.	146	●	—	—	04	N. E. Dixon, C.E.
	Peterborough (Eye)	52 36	0 11 W.	—	III	—	m.	—	S. W. Egan.
	Raunds	52 22	0 33 W.	205	III	—	W.m.	11	Leon G. H. Lee.
	Thrapston	52 22	0 35 W.	251	III	⊙	m.	—	E. N. Plevins.
Nottingham:—	Bawtry, Hesley Hall ...	53 27	1 4 W.	65	III	—	W.m.	09	B. I. Whitaker, J.P.
	Kingston-on-Soar ...	52 51	1 14 W.	125	III	—	m.	11	Fred Wakerly.
	Nottingham	52 56	1 9 W.	82	T, II_2	⊙ (◪ B ●)	D.W.M.r.	11	Arthur Brown, M.Inst.C.E., and Philip Boobbyer, M.D., for the Corporation.
	Strelley	52 58	1 15 W.	377	III	⊙	m.	—	T. L. K. Edge.
	Worksop (Hodsock) ...	53 22	1 5 W.	56	III	⊙ (B ●)	w.M.	11	H. Mellish, J.P.
Oxford:—	Oxford	51 46	1 16 W.	208	[I] T	⊙ [I]	D.W.M.	11	The Radcliffe Observer.
	Pyrton Hill	51 38	1 1 W.	500	—	K ◪ B	k.	—	W. H. Dines, F.R.S., for M.O.

	Combe).		01 38	1 0 W.	474	●	—	—	—	A. H. Pawson
Rutland :—	Ridlington		52 37	0 45 W.	523	●	—	—	—	N. W. Wortley.
	Uppingham		52 38	0 43 W.	469	III	—	—	—	E. Hunter.
Warwick :—	Coventry		52 25	1 30 W.	270	III	⊙	M.	10	E. Hugh Snell, M.D., for the Corporation.
	Rugby School		52 22	1 15 W.	379	II	(B)	m.	11	Rev. D. E. Shorto, M.A.
	Birmingham, Edgbaston		52 28	1 56 W.	535	II	⊙	d.W.M.r.	10	Alfred Cresswell, for the Midland Institute.
	,, Hagley Road		52 28	1 58 W.	612	●	—	—	—	Henry E. Stilgoe, M.Inst.C.E.
	Water Dept. :—									
	Frankley ...		52 25	1 59 W.	569	●	—	—	—	
	Whitacre ...		52 31	1 40 W.	268	●	—	—	—	
	Witton		52 32	1 52 W.	344	●	—	—	—	
Yorkshire, W. Riding :—	Bradford		53 49	1 46 W.	439	III	⊙	m.r.	09	H. Lander for the Corporation.
	Garforth		53 48	1 22 W.	195	II	⊙	M.	09	Prof. Seton, B.Sc., for the University of Leeds.
	Giggleswick		54 4	2 17 W.	500?	III	(B) ⊙	—	05	P. Haswell, B.A.
	Harrogate		54 0	1 33 W.	476	III	⊙	d.W.m.	11	C. E. Rivers, for the Corporation.
	Huddersfield		53 39	1 47 W.	409	II_2	⊙ (●)	M.r.	09	J. Firth, Registrar, for the Corporation.
	Leeds		53 48	1 33 W.	132	III	(B)	—	08	H. Crowther, for the Leeds Philosophical Society.
	Meltham		53 36	1 50 W.	513	III	—	m.	—	C. L. Brook.
	Sheffield		53 23	1 29 W.	429	II	⊙	w.M.	11	E. Howarth, F.R.A.S.
	Wakefield		53 41	1 30 W.	96	II	—	M.	11	Alex. French, M.R.C.S., L.R.C.P.
(b) *Western Part.*										
Gloucester :—	Cheltenham		51 54	2 3 W.	214	II	⊙	M.	09	A. C. Saxby, for the Corporation.
	Cirencester		51 43	1 57 W.	446	III	⊙	W.m.	11	Prof. M. Kershaw, B.A., for the Royal Agricultural College.
	Dursley		51 41	2 21 W.	256	●	—	—	96	E. Fryer Smith.

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Berkshire—cont.	*Wantage (King Alfred's School).*	*51 53*	*1 26 W.*	*314*	*III*	—	—	—	J. H. Scott.
	Wokingham	51 23	0 48 W.	216	III	B	m.	10	Medical Superintendent of Sanatorium.
Hampshire :—	Aldershot	51 15	0 46 W.	231	III	—	m.	—	G. W. Routley, M.D.
	Basingstoke	51 16	1 6 W.	289	III	—	m.	10	A. M. Pitkin, F.R.G.S.
	Bournemouth	50 43	1 53 W.	145	III	⊙	d.w.m.	11	C. Dales, for Town Council.
	Grayshott	51 7	0 46 W.	661	III	⊙	M.	—	Mrs. Charlotte Lyndon.
	Petersfield (Ditcham Park).	51 0	0 57 W.	550	—	K	k.	—	C. J. P. Cave, M.A.
	Portsmouth	50 48	1 6 W.	11	III	—	r.w.M.	10	A. Mearns Fraser, M.D., for the Corporation.
	Sandown	50 48	1 8 W.	20	III	⊙ (B)	m.	—	G. E. Gilchrist, for the Sandown Advancement Board.
	Southampton	50 55	1 24 W.	65	II	⊙	W.M.S.	09	A. Vaughan, for Director-General of Ordnance Survey.
	Southsea	50 47	1 6 W.	—	—	⊙	d.	10	A. Mearns Fraser, M.D., for the Corporation of Portsmouth.
	Stockbridge (Ashley) ...	51 5	1 27 W.	235	●	B	—	—	Legh S. Powell.
	Swarraton	51 8	1 11 W.	310	III	—	W.m.	09	Rev. W. L. W. Eyre, M.A.
	Totland Bay	50 41	1 33 W.	140	III	⊙	m.	10	J. Dover, M.A.
	Ventnor	50 36	1 13 W.	80	III	⊙	W.M.	11	Miss M. Gibson, for Royal National Hospital for Consumption.
Kent :—	Broadstairs	51 21	1 26 E.	140	●	⊙	(m.)	—	Howard Hurd, C.E., and Rev. H. C. V. Snowden, for District Council.
	Canterbury	51 17	1 5 E.	39	III	—	w.	05	A. Lander.
	Deal	51 13	1 24 E.	23	III	⊙	d.	10	S. Miller.
	Dover	51 7	1 18 E.	198	●	—	—	96	W. C. Hawke, C.E., for the Corporation of Dover.
	Dover	51 7	1 19 E.	231	T	⊙	D.M.	11	
	Kearsney, Chilton Farm	51 8	1 17 E.	125	●	—	—	—	
	Dungeness	50 55	0 58 E.	21	T	B	D.W.M.	11	Lightkeeper, for M.O.
	Folkestone	51 5	1 11 E.	121	III	⊙ (●)	d.m.	11	The Borough Engineer, for the Corporation.

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										Officer of Health.
	Hastings Cemetery	50 52	0 34 E.	499	●	—	—	—		Walter Field.
	„ Waterworks	50 51	0 34 E.	270	—	⊙	d.w.(m.)	06		J. Farnham, for the Corporation.
	Heathfield	50 58	0 16 E.	499	●	—	—	—		J. F. Leigh Clare.
	Hove	50 47	0 10 W.	—	—	⊙	m.	—		A. Griffith, M.O.H., for the Corporation.
	Midhurst	50 59	0 44 W.	480	III	⊙	m.	—		T. L. Evans, M.R.C.S.
	Newick Rectory	50 58	0 1 E.	133		—	—	—		Mrs. R. O. Powell.
	St. Leonards	50 51	0 33 E.	178	II	—	W.M.	11		H. Colborne, M.R.C.S., for the Corporation.
	„ West Marina	50 51	0 32 E.	20?	III	—	—	06		T. Eldridge, for the Corporation.
	Seaford	50 46	0 6 E.	30	III	⊙	d.	09		Col. F. W. Savage, V.D.
	Selsey Bill	50 43	0 47 W.	19	III	⊙	m.	—		E. Heron Allen.
	Watergate Park	50 56	0 55 W.	239	●	—	—	99		W. M. Christy.
	Westbourne	50 52	0 55 W.	30	—	⊙	(m.)	07		Rev. L. B. Birkett.
	Worthing	50 49	0 22 W.	36	III	⊙	d.w.m.	11		R. H. W. Wilshaw, M.B., D.P.H., for the Corporation.
Wilts:—	Malmesbury	51 35	2 5 W.	235	III	—	m.	—		George Deadman for C. E. Bertodano.
	Marlborough	51 25	1 44 W.	424	III	⊙	W.m.	11		G. G. Becher, M.A., and Meddows Taylor.
	Salisbury (Wilton)	51 4	1 51 W.	180	II	—	M.	10		Thos. Challis, for the Earl of Pembroke, G.C.V.O.
	Salisbury	51 5	1 50 W.	165	II	—	—	10		Capt. H. Tudor Williams.
	Sutton Veny	51 10	2 7 W.	389	●	—	—	—		R. W. Pretor Pinney.
LONDON DISTRICT.										
	Barnet	51 39	0 10 W.	211	III	—	—	06		F. J. Bancroft, B.Sc., M.I.A.C.E., M.I.M.E.
	Camberwell—									
	The Green	51 28	0 5 W.	17	—	●	—	03		W. Oxtoby, M.I.C.E., for the Camberwell Borough Council.
	Forest Hill	51 26	0 4 W.	160	—	●	—	03		
	Leyton Square	51 29	0 4 W.	14	—	●	—	03		
	Peckham Rd.	51 28	0 5 W.	21	—	●	—	03		

The names of Stations added to the list since April, 1911, are printed in clarendon type. Those discontinued during the year are printed in italic type. The positions of the Stations can be identified on the map, Fig. 2, p. 84, from the figures which give their heights above Mean Sea Level.

List of Stations arranged according to Districts and Counties—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Autographic.			
LONDON DISTRICT—*cont.*								
Camden Square ...	51 33	0 8 W.	110	II	⊙ (B ●)	M.d.	—	H. R. Mill, D.Sc., LL.D.
Chelsea...	51 29	0 10 W.	24	●	—	—	—	T. W. E. Higgens, C.E., for the Chelsea Borough Council.
City (Bunhill Row) ...	51 31	0 5 W.	80	—	⊙	w.(m.)d.	—	Messrs. De la Rue.
East Ham	51 32	0 3 E.	12	III	—	—	—	J. Banks, for the Corporation.
Eltham...	51 28	0 4 E.	209	III	—	m.	—	Miss A. Bramwell, B.Sc.
Enfield	51 50	0 10 W.	100	III	⊙	m.	—	W. P. Warren.
Golder's Green ...	51 34	0 12 W.	231	III	—	m.	—	J. W. Duncan.
Greenwich	51 28	0 0	155	I	(I)	W.M.r.d.	—	The Astronomer Royal.
Hampstead	51 33	0 11 W.	450	II	⊙	M.d.	09	E. L. Hawke, for the Hampstead Scientific Society.
Hampstead	51 33	0 11 W.	375	III	—	m.	—	H. W. Braby, B.A.
Isleworth	51 29	0 20 W.	24	III	—	—	—	A. Worsley.
Kensal Green	51 32	0 13 W.	100	●	—	—	—	C. W. Heinemann.
Kew	51 28	0 19 W.	18	I, T	I	W.M.H, H_2h.	—	C. Chree, Sc.D., F.R.S., Superintendent of the Observatory, for the Meteorological Office.
Manor Park ...	51 33	0 3 E.	—	●	—	—	—	A. J. Wilmshurst.
Norwood	51 26	0 6 W.	220	II	—	M.	09	W. Marriott.
Pall Mall	51 30	0 7 W.	—	—	B	—	—	Athenæum Club.
Plumstead	51 29	0 6 E.	300	—	⊙	m.	01	J. G. Waller.
South Kensington ...	51 30	0 10 W.	31	9, 13, 15, 17, 18h.	⊙ B θ ●	M.	—	The Staff of the Meteorological Office.
Tottenham	51 36	0 5 W.	51	II	⊙	W.M.	10	The Medical Officer of Health for Urban District Council.
Westminster	51 30	0 8 W.	27	III	●	W.M.	—	H.M. Office of Works.
„ Training Coll.	51 30	0 8 W.	107	—	⊙	D.W.M.	—	J. H. Cowham and Rev. H. B. Workman, D.Lit.

6. (*a*) SCOTLAND, WEST.									
Argyleshire:—	Ardnadam ...	55 59	4 56 W.	64	III	(B)	m.	—	Rev. J. Cairns Mitchell, B.D.
	Gruline, Isle of Mull	56 30	6 0 W.	100	●	—	—	—	J. W. Mellea.
	Loch Awe:—								
	Cruachan Bothy	56 14	5 28 W.	283	●	—	—	10	John Boyd, Crown Forester. .
	Ford	56 10	5 26 W.	148	●	—	—	10	
	Oban	56 25	5 30 W.	20	II	⊙	d.m	11	Edwin Baily, M.B., for District Council.
	§Poltalloch	56 8	5 30 W.	132	II	—	W.M.	10	D. S. Melville, for Col. Malcolm.
Ayr:—	§Colmonell	55 8	4 53 W.	150	III	(B)	W.M.	09	A. Ogg, for J. W. McConnel.
	Kilmarnock ...	55 37	4 36 W.	90	III	⊙	W.m.	11	G. M. Stuart and Thomas Moffat, for the West of Scotland Agric. Coll.
Bute:—	§Rothesay	55 50	5 4 W.	73	II	—	W.M.	10	D. Penney.
Dumbarton:—	No station.								
Dumfries:—	§Dumfries	55 4	3 36 W.	160	II	⊙	W.M.	09	C. C. Easterbrook, M.D., for the Crichton R. Institution.
	Eskdalemuir ...	55 19	3 12 W.	799	I	I	M.S.H_1, H_2 h.	—	G. W. Walker, M.A., Superintendent of the Observatory.
	S. Ruthwell	55 0	3 26 W.	67	II	⊙	m.	10	W. H. Whellens, for A. Johnstone Douglas.
Kirkcudbright:—	§Cally (Gatehouse)	54 52	4 12 W.	120	II	—	W.M.	10	W. Thomson, for Col. F. Murray Baillie.
Lanark:—	Glasgow	55 53	4 18 W.	180	I	I	W.M.S.	11	Prof. L. Becker, Ph.D., for M.O.
	Thorntonhall ...	55 46	4 15 W.	440	III	⊙ B	m.	11	John Wilson, for A. Henderson Bishop.
Renfrew:—	No station.								
Stirling:—	No station.								
Wigton:—	No station.								
6. (*b*) ISLE OF MAN.									
	Douglas	54 10	4 28 W.	277	II	⊙	W.M.S.	10	Frank Cottle, for the Corporation.
	„	54 10	4 29 W.	137	—	B	—	—	Mrs. A. W. Moore.

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List of Stations arranged according to Districts and Counties—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Autographic.			
7. (*a*) ENGLAND, NORTH WEST.								
Cheshire:— Bidston	53° 24′	3° 4′ W.	188	(I) T	(I) ⊙	D.W.M.r.	10	W. E. Plummer, M.A., F.R.A.S., for the Mersey Docks and Harbour Board.
Hawarden Bridge ...	53 12	3 1 W.	22	III	—	W.m.	11	John Summers & Sons, Ltd.
Hoylake	53 23	3 12 W.	30?	III	⊙	w.m.	02	Tom Robinson and R. W. Fraser, for Urban District Council.
Macclesfield ...	53 16	2 8 W.	500	III	—	m.	—	John Dale.
Northwich	53 16	2 30 W.	117	III	—	—	—	J. A. Saner.
Cumberland:— Aspatria	54 46	3 21 W.	250	II	⊙ (🌧)	W.M.	09	J. Smith Hill, B.A., B.Sc., Agricultural College.
Egremont	54 29	3 30 W.	349	II	—	M.	—	J. W. Sherwen.
Newton Rigg... ...	54 40	2 49 W.	559	II	⊙	W.M.	11	W. T. Lawrence, for the Cumberland County Council.
Scaleby	54 54	2 52 W.	41	III	—	m.	—	Sir R. A. Allison, J.P., D.L.
Seathwaite ...	54 30	3 10 W.	422	III	—	m.	—	Mrs. A. Pepper, for M.O.
Uldale (Chapel House Reservoir).	54 43	3 9 W.	599	●	—	—	—	T. Strong, for Aspatria and Silloth Water Board.
Lancashire:— Blackpool	53 49	3 3 W.	66	II	⊙ (B 🌧 ●)	d.W.M.	11	E. W. Rees Jones, M.D., D.P.H., for the Corporation.
Bolton	53 35	2 27 W.	—	III	⊙	m.	—	Thos. Midgley.
Burnley	53 48	2 15 W.	459	III	⊙ (B)	m.r.	11	Thos. Holt, M.D., for the Corporation.
Carnforth (Over Kellet).	54 8	2 44 W.	174	III	⊙	m.	11	W. Farrer.
Darwen	53 41	2 28 W.	722	II	⊙	d.M.	11	F. G. Haworth, M.B., for the Corporation.
Fleetwood	53 56	3 1 W.	—	—	🌧	—	11	The Urban District Council, for the Meteorological Office.

	Graythwaite	*54 19*	*3 0 W.*	*180*	●	—	—	—	H. T. Gnosspelius.
	Lancaster	*54 3*	*2 47 W.*	*311*	*III*	⊙ (⁄) ●	m.	11	Neville Holden, F.R.A.S., for the Storey Institute.
	Leyland	53 41	2 42 W.	124	III	⊙	m.	—	H. Nowell ffarington.
	Rossall Beach ...	53 55	3 2 W.	0	III	B	d.	—	T. G. Benn.
	Manchester (Oldham Road).	53 29	2 13 W	190	II	⊙	M.w.	11	J. Niven, M.A., M.B., for the Corporation.
	„ (Whitworth Park).	53 28	2 14 W.	125	II	K ⊙ (B ⁄)	d.M.	11	The University of Manchester.
	„ (*Prestwich*)	53 32	2 17 W.	320	II	⊙	W.M.r.	11	F. Gore, for Medical Superintendent of the Asylum.
	Southport	53 39	2 59 W.	37	II_2	(I) ⊙ ⁄	d.w.M. ⁄	11	J. Baxendell, for the Corporation.
	Stonyhurst	53 51	2 28 W.	375	I	I	W.M.S. ⁄	11	Rev. W. Sidgreaves, S.J., for M.O.
Westmorland:—	Kirkby Lonsdale ...	54 12	2 36 W.	304	●	—	—	—	R. A. Clarke.
	7. (*b*) NORTH WALES.								
Anglesey:—	Dwyran	53 9	4 18 W.	16	II	⊙ ⁄ (B)	M.	—	W. E. Sotheby.
	Holyhead (Salt Island)	53 18	4 39 W.	57	—	⁄	⁄	11	F. M. Cotton, C.E., for M.O.
	„ (town) ...	53 18	4 39 W.	48	T, II_2	B	D.W.M.	11	T. Chope, for M.O.
	Llanerngrad	53 20	4 16 W.	414	II	⊙ ⁄ (B)	M.	10	W. E. Sotheby.
Carnarvon:—	Colwyn Bay	53 16	3 44 W.	81	III	⊙	d.m.	10	Wm. Jones, A.M.I.C.E., for Urban District Council.
	Llanberis	53 5	4 0 W.	913	III	—	m.	—	A. Lockwood.
	Llandudno	53 20	3 50 W.	71	II	⊙	d.W.M.	10	William Little, for the Town Council.
	Penrhyn Quarry ...	53 10	4 6 W.	527	●	—	—	01	W. J. Griffith, for Lord Penrhyn.
	Snowdonia:—								
	Bungalow ...	53 4	4 1 W.	309	●	—	—	—	A. Lockwood.
	Copper Mill ...	53 4	4 3 W.	1,479	●	—	—	—	
	Intake	53 4	4 2 W.	1,479	●	—	—	—	
	Old Road... ...	53 4	4 0 W.	324	●	—	—	—	
	Pen-y-Gwryd ...	53 5	4 0 W.	913	●	—	—	—	
Denbigh:—	Bettws-y-Coed ...	53 7	3 53 W.	101	II	⊙	d.W.M.	11	Dr. H. W. Fox and R. D. Jones, for District Council.
	Ruthin (Llanbedr Hall)	53 8	3 17 W.	450	III	—	m.	—	George A. Crace-Calvert, M.B.

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List of Stations arranged according to Districts and Counties—*continued.*

County and Station.		Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
					Eye Obs.	Autographic.			
7. (*b*) NORTH WALES—*cont.*									
Flint:—	Penbedw	53 12	3 11 W.	650	—	B	—	—	H. W. Buddicom.
	Rhyl	53 19	3 29 W.	30	III	⊙	d.w.m.	11	A. A. Goodall, for District Council.
	St. Asaph (St. Beuno's College).	53 15	3 23 W.	479	III	(B)	m.	10	Rev. J. Rowland, S.J. and Rev. C. Baillon, S.J., B.Sc.
Merioneth:—	Aberdovey	52 33	4 4 W.	22	III	⊙	w.m.	10	W. J. Eves.
	Towyn	52 35	4 5 W.	10	III	⊙	d.	10	Urban District Council.
Montgomery:—	Welshpool	52 39	3 8 W.	254	III	—	m.	—	A. S. Whitehouse.
8. (*a*) SOUTH WALES.									
Brecknock:—	Gwernyfed Park ...	52 5	3 15 W.	374	III	—	m.	—	James Slade, for Col. Wood.
	Llangammarch Wells	52 7	3 32 W.	550	III	⊙	W.M.	09	W. Black Jones, M.D., B.Sc., D.P.H.
Cardigan:—	Aberystwyth... ...	52 25	4 4 W.	59	III	⊙	d.w.m.	10	A. Thomas, M.D., for the Urban Council.
	Lampeter	52 7	4 5 W.	498	●	—	—	—	John C. Harford.
Carmarthen:—	Llandovery	51 59	3 48 W.	248	●	—	—	—	Douglas T. M. Jones.
Glamorgan:—	Cardiff	51 28	3 10 W.	203	III	⊙	W.m.r.	10	E. Walford, M.D., for the Corporation.
	Port Talbot	51 34	3 45 W.	179	●	⊙	(m.)	03	Miss Talbot; G. Lipscomb.
	Swansea	51 37	3 55 W.	24	III	⊙	m.	10	D. Bliss, for the Corporation.
Pembroke:—	Haverfordwest ...	51 48	4 58 W.	93	(II)	⊙ (B)	(m.)	10	J. W. Phillips.
	Pembroke (St. Ann's Head).	51 41	5 11 W.	149	T, II_3	⊙	D.W.M.	11	Lightkeepers, for M.O.
	Tenby...	51 41	4 42 W.	79	—	⊙	w.(m.)	03	Miss M. B. Truscott, for the Corporation.
Radnor:—	Llandrindod Wells ...	52 14	3 23 W.	699	●	—	—	—	W. B. de Winton.
	Rhayader Watershed	52 18	3 29 W.	*	(15) ●	—	—	—	Corporation of Birmingham, Water Department.

8. (*b*) ENGLAND, SOUTH WEST.									
Cornwall:—	**Falmouth ... ...**	**50 9**	**5 4 W.**	**167**	**I**	**I**	**W.M.S.H.h.**	**11**	**Royal Cornwall Polytechnic Society, for M.O.**
	„ Pendennis Castle.	**50 8**	**5 3 W.**	**—**	**—**	**⁄**	**—**	**11**	**Coastguard, for M.O.**
	Fowey	**50 21**	**4 38 W.**	**51**	**III**	**⊙**	**m.**	**10**	**Dr. W. H. Boger.**
	Newquay	**50 25**	**5 4 W.**	**190**	**T**	**⊙**	**w.M.**	**11**	**C. C. Vigurs. B.A., M.D., for Urban District Council.**
	Penzance	**50 7**	**5 32 W.**	**54**	**III**	**⊙ (B)**	**m.**	**10**	**Chas. H. Benn, for District Council.**
	Redruth	**50 14**	**5 14 W.**	**398**	**III**	**—**	**m.**	**—**	**A. P. Jenkins.**
Devonshire:—	**Arlington Court ...**	**51 8**	**3 58 W.**	**613**	**III**	**—**	**W.m.**	**10**	**W. W. Pike, for Miss Chichester.**
	Ashburton	**50 32**	**3 46 W.**	**583**	**III**	**—**	**m.**	**—**	**J. S. Amery.**
	Barnstaple	**51 5**	**4 3 W.**	**24**	**III**	**—**	**—**	**06**	**Thos. Wainwright, for the North Devon Athenæum.**
	Cullompton	**50 51**	**3 23 W.**	**202**	**III**	**⊙**	**W.m.**	**10**	**Murray T. Foster.**
	Ilfracombe	**51 12**	**4 8 W.**	**199**	**III**	**⊙**	**m.**	**—**	**O. M. Prouse, A.M.I.C.E.**
	Killerton	**50 44**	**3 32 W.**	**159**	**III**	**—**	**m.**	**—**	**John Wilson, for Sir T. Acland, Bt.**
	Paignton	**50 26**	**3 34 W.**	**11**	**II**	**⊙ (B)**	**m.d.**	**10**	**A. J. Holman, for Town Council.**
	Plymouth	**50 22**	**4 8 W.**	**116**	**II_s**	**⊙ ⁄ (B)**	**d.W.M.r. ⁄**	**11**	**H. Victor Prigg, A.M.I.C.E., for the Corporation.**
	Princetown ...	**50 33**	**3 59 W.**	**1,359**	**III**	**—**	**m.**	**—**	**G. Berry.**
	Rousdon	**50 43**	**3 0 W.**	**515**	**III**	**⊙**	**m.**	**—**	**C. Grover, for Hon. Lady Peek.**
	Sidmouth	**50 41**	**3 15 W.**	**147**	**III**	**—**	**m.**	**—**	**Miss C. Radford.**
	Tavistock	**50 33**	**4 10 W.**	**374**	**III**	**—**	**m.**	**—**	**W. J. Monk.**
	Salcombe	**50 14**	**3 46 W.**	**39**	**—**	**⊙**	**m.w.**	**04**	***The late* J. Fairweather and Capt. John Partridge.**
	Sheepstor	**50 29**	**4 1 W.**	**749**	**II**	**—**	**M.**	**10**	**Rev. H. H. Breton, M.A.**
	Teignmouth	**50 33**	**3 29 W.**	**20**	**III**	**⊙**	**d.m.**	**10**	**G. Rossiter for M.O.H.**
	Torquay	**50 28**	**3 31 W.**	**12**	**III**	**⊙**	**d.w.m.**	**00**	**F. March, for the Corporation.**
	***Whitchurch* ... ...**	**50 32**	**4 6 W.**	**593**	**II**	**—**	**M.**	**10**	**E. E. Glyde.**
	Woolacombe	**51 10**	**4 12 W.**	**59**	**II**	**⊙**	**M.**	**10**	**T. S. Watkinson, for Miss Chichester.**

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*** 15 Rainfall Stations.**

List of Stations arranged according to Districts and Counties—*continued.*

County and Station.		Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
					Eye Obs.	Autographic.			
8. (*b*) ENGLAND, SOUTH-WEST —*cont.*									
Dorset :—	Creech Grange ...	50° 38′	2° 8′ W.	239	●	—	—	—	J. W. G. Bond.
	Dorchester... ...	50 43	2 27 W.	310	III	⊙	m.	—	Borough Engineer.
	Portland Bill... ...	50 32	2 27 W.	19	T, II_s	B	D.W.M.	11	Lightkeeper, for M.O.
	Shaftesbury	51 1	2 12 W.	722	III	—	W.m.	10	Rev. F. Ehlvers.
	Weymouth	50 36	2 27 W.	21	III	⊙	d.m	11	I. J. Brown and J. H. Bolam.
Gloucester :—	Bristol, Over Court Park.	51 32	2 35 W.	147	III	—	r.	07	R. C. Cann Lippincott.
	Clifton, Bristol ...	51 27	2 37 W.	229	III	⊙	W.m.	09	D. Rintoul, M.A.
Monmouth :—	*Abergavenny*	51 49	3 2 W.	178	●	—	—	—	A. V. Whitehead.
	Abersychan	51 44	3 5 W.	698	●	—	—	—	W. P. James.
	Newchurch	51 41	2 48 W.	525	●	—	—	—	C. Cullum, for the Corporation of Newport.
	Newport	51 35	3 0 W.	32	III	—	—	04	
	Pant-yr-eos	51 38	3 4 W.	449	●	—	—	00	
	Ynis-y-fro	51 38	3 3 W.	151	●	—	—	00	
Somerset :—	Minehead	51 12	3 29 W.	104	III	⊙	m.	—	R. Shafto Adair.
	Weston - Super - Mare.	51 21	2 59 W.	29	III	⊙	m.	—	Sydney C. Smith.
9. IRELAND, NORTH. (a) *Western Part.*									
Galway :—	Ardfry	53 19	9 0 W.	—	—	B	—	—	W. M. Tattersall, for the Department of Agriculture for Ireland.
	Recess	53 28	9 44 W.	90	●	—	—	—	M. Macarthy, for the M. G.W. Railway.
Leitrim :—	Carrigallen	53 58	7 38 W.	350?	●	—	—	—	Miss Morrow.
Mayo :—	Blacksod Point ...	54 6	10 4 W.	37	T, II_s	B	D.W.M.R.r.	11	The Chief Officer, Coastguard, for M.O.
	Mallaranny	53 55	9 40 W.	119	●	—	—	11	The Manageress of the Hotel for the M. G.W. Railway.

Roscommon :—	**No station.**								
Sligo :—	**Markree Castle ...**	**54 11**	**8 27 W.**	**122**	**II**	**⊙**	**W.M.S.R.**	**09**	**J. R. Armstrong, for Captain Cooper.**
	(b) *Eastern Part.*								
Antrim :—	**Belfast ... ...**	**54 35**	**5 56 W.**	**61**	**III**	**—**	**M. R.**	**09**	**John Wylie, B.A., and G. Robinson, for Prof. Morton.**
	Glenarm	**54 58**	**5 56 W.**	**41**	**●**	**—**	**—**	**—**	**The Earl of Antrim.**
	Lisburn	**54 31**	**6 8 W.**	**206**	**III**	**—**	**—**	**—**	**John Ridges, M.A.**
Armagh :—	**Armagh ... ...**	**54 21**	**6 39 W.**	**196**	**II**	**◢⊙●**	**W.M.S.R.**	**11**	**J. L. E. Dreyer, Ph.D., for M.O.**
Cavan :—	**No station.**								
Donegal :—	**Dunfanaghy ... ...**	**55 11**	**7 58 W.**	**54**	**II**	**—**	**m.**	**11**	**J. J. MacGrath, L.R.C.P.**
	Killybegs	**54 40**	**8 27 W.**	**221**	**●**	**—**	**—**	**—**	**John C. Ward.**
	Malin Head	**55 23**	**7 24 W.**	**208**	**T**	**B**	**D.W.M.R.r.**	**11**	**Chief Officer, Coastguard, for M.O.**
Down :—	**Donaghadee ... ...**	**54 38**	**5 32 W.**	**40**	**T, II$_2$**	**B**	**D.W.M.R.r.**	**11**	**Coastguard, for M.O.**
Fermanagh :—	**No station.**								
Londonderry :—	**No station.**								
Longford :—	**Newtown Forbes..**	**53 46**	**7 51 W.**	**?172**	**II**	**—**	**m.**	**—**	**L. A. Boyle, for the Earl of Granard.**
Louth :—	**No station.**								
Meath :—	**No station.**								
Monaghan :—	**No station.**								
Tyrone :—	**No station.**								
Westmeath :—	**No station.**								
10. IRELAND, SOUTH.									
	(a) *Eastern Part.*								
Carlow :—	**No station.**								
Dublin :—	***Donabate* ... ...**	**53 29**	**6 7 W.**	**55**	**II**	**—**	**m.**	**—**	***The late* Henry Cullinan, L.R.C.P.I.**
	Dublin City	**53 20**	**6 15 W.**	**47**	**II**	**B**	**d.W.M.R.**	**07**	**Sir John W. Moore, M.D., D.Sc.**
	„ Phœnix Park	**53 22**	**6 21 W.**	**155**	**II**	**⊙◢**	**w.M.S.**	**11**	**Lt.-Col. C. C. J. Pery, R.E., Ordnance Survey Office.**
	„ Botanic Gardens.	**53 23**	**6 16 W.**	**67**	**II**	**—**	**m.**	**07**	**F. W. Moore, M.R.I.A.**

The names of Stations added to the list since April, 1911, are printed in clarendon type. Those discontinued during the year are printed in italic type. The positions of the Stations can be identified on the map, Fig. 2, p. 84, by the figures which give their heights above Mean Sea Level.

List of Stations arranged according to Districts and Counties—*continued.*

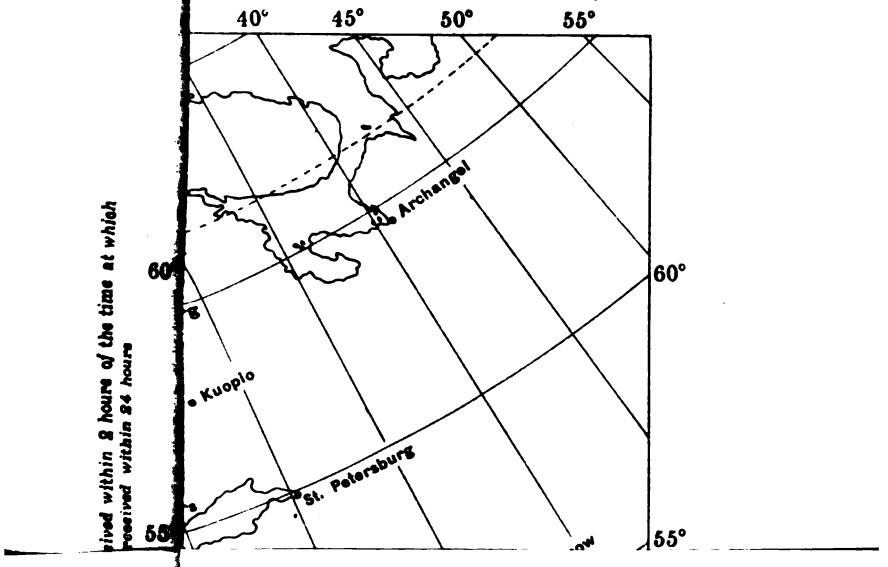
County and Station.		Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
					Eye Obs.	Autographic.			
10. IRELAND, SOUTH—*cont.*									
(a) *Eastern Part*—cont.									
Dublin—*cont.*	Dublin, Trinity College	53° 21′	6° 16′ W.	12	II	⊙	M.(R.)w.	07	W. J. Good and W. H. Clark, for Prof. Thrift.
	Killiney	53 16	6 7 W.	249	●	—	—	—	Mrs. G. B. Symes.
	Kingstown	53 17	6 8 W.	42	III	⊙	m.	11	J. S. Vaughan, LL.D., Town Clerk, for the Corporation.
	,, Harbour ...	53 17	6 8 W.	—	—	◢	◢	11	Captain A. F. Holmes, R.N., for H.M. Office of Works.
Kildare:—	Clongowes Wood College.	53 19	6 41 W.	245	II	(B Θ) ⊙	m.	09	Rev. J. J. Nerney, S.J., and Rev. C. J. Byrne, S.J.
Kilkenny:—	Kilkenny	52 39	7 14 W.	212	III	B	W.m.	09	E. Sutton, for the Marquis of Ormonde, K.P.
King's Co.:—	Birr Castle	53 6	7 55 W.	175	T	⊙	D.W.M.S.R.r.	11	Dr. Boeddicker, for the Earl of Rosse.
Queen's Co.:—	Mountmellick ...	53 7	7 20 W.	258	III	—	m.	09	W. A. Robinson.
Waterford:—	Waterford	52 16	7 7 W.	—	—	B	—	02	Harbour Authorities.
	,, ...	52 16	7 7 W.	20?	III	—	W.m.R.	11	J. N. White.
	De La Salle Training College.	52 15	7 6 W.	20	III	—	—	—	Rev. M. J. Healey, B.Sc.
Wexford:—	Wexford	53 15	6 30 W.	100	III	—	m.	—	Charles Bain.
Wicklow:—	Newcastle	53 5	6 6 W.	256	II	—	m.	02	J. T. Crowe, M.D., and C. D. Hanan, M.B.

	Mount Callan ...	52 52	9 16 W.	479	●	—	—	98	Lt.-Col. Tottenham.
	Newmarket-on-Fergus.	52 46	8 53 W.	85	●	—	—	98	Alfred Barker, for W. W. A. Fitzgerald.
	Quilty...	52 50	9 28 W.	*	—	◢	—	11	W. Barrington, M.I.C.E., for the West and South Clare Railway Co.
Cork :—	Ballinacurra... ...	51 52	8 10 W.	24	III	⊙	w.m.	10	John H. Bennett.
	Roche's Point ...	51 47	8 15 W.	32	T	—	D.W.M.R.r.	11	M.FitzMahony, Post Office, for M.O.
	" " ...	51 47	8 15 W.	—	—	◢	◢	10	Captain G. Usborne, for Cork Harbour Commissioners.
Kerry :—	Caragh Lake... ...	52 3	9 53 W.	59	●	—	—	—	Admiral E. F. Jeffreys, C.V.O.
	Killarney	52 4	9 30 W.	174	III	—	W.m.R.	09	R. W. Griffin, M.D.
	Valencia	51 56	10 15 W.	30	I, T	I, B	D.W.M.R.r.H,h.	11	J. E. Cullum, for M.O.
	" Glanleam ...	51 56	10 20 W.	—	●	—	—	01	Miss A. O'Donoghue.
Limerick :—	Foynes	52 37	9 7 W.	108	III	—	W.m.	09	J. J. Alcorn, for Lord Monteagle, K.P.
	Limerick (Derravoher)	52 38	8 40 W.	40	●	—	—	09	Sir A. W. Shaw.
	" (Mungret Coll.).	52 38	8 41 W.	47	II	(B) K ⊙	M.R.k.	10	Rev. W. O'Leary, S.J.
Tipperary :—	Cahir (Bengurragh)	52 22	7 56 W.	199	III	—	W.m.	10	R. W. Smith, Jun.
	11. ENGLISH CHANNEL (WESTERN SECTION).								
Guernsey :—	St. Peter Port, Villa Carey.	49 27	2 32 W.	180	III	⊙	W.m.	08	F. E. Carey, M.D.
	St. Peter Port, Brooklyn.	49 27	2 31 W.	297	II	⊙ (B Θ)	w.M.	08	Adolphus Collenette.
Jersey :—	St. Aubin's	49 12	2 11 W.	25	T, II_2	—	D.W.M.	10	J. Fisher, for M.O.
	St. Helier's	49 11	2 6 W.	—	—	⊙	d.w.(m.)	10	Signal Officer, Fort Regent, for M.O.
Scilly :—	St. Mary's	49 56	6 18 W.	131	T, II_2	B ◢ ⊙	D.W.M. ◢	11	The Coastguard, for M.O.

The names of Stations added to the list since April, 1911, are printed in clarendon type. Those discontinued during the year are printed in italic type. The positions of the Stations can be identified on the map, Fig. 2, p. 84, by the figures which give their heights above Mean Sea Level.

* Height of anemometer head above *ground* 40 feet.

To face p. 108.


40°
45°
50°
55°
60°
60°
Archangel
Kuoplo
St. Petersburg
55°
rived within 2 hours of the time at which
eceived within 24 hours

List of additional Stations contributing Evening Reports, generally at 6 p.m., to the Daily Weather Report:—

Scotland
- Oban.
- Stonehaven.
- Carnoustie.

England, N.E.
- Harrogate.
- Scarborough.

England, N.W.
- Blackpool.
- Southport.
- Buxton.
- Douglas.

Wales ...
- Rhyl.
- Colwyn Bay.
- Llandudno.
- Bettws-y-Coed.
- Aberystwyth.

England, E.
- Walton-on-the-Naze.
- Lowestoft.
- Felixstowe.
- Southend-on-Sea.

England, S.E.
- Ramsgate.
- Margate.
- Deal.
- Littlestone-on-Sea.
- Folkestone.
- Hastings.
- Bexhill-on-Sea.
- Eastbourne.
- Seaford.
- Brighton.
- Worthing.
- Bognor.
- Southsea.
- Bournemouth.

England, S.W.
- Weymouth.
- Teignmouth.
- Torquay.
- Paignton.
- Weston-super-Mare.

9 p.m. Reports.
- Dublin.
- Plymouth.
- Darwen.
- Manchester.
- Birmingham.

List of Sea Temperature Stations.

§*Aberdeen, Cove Bay.
*Arran, North, Galway.
†Bahama Bank Lightship.
§ Ballantrae, Ayrshire.
*Ballydonegan, Co. Cork.
†Barrels Rock Lightship.
*Blacksod Point, Co. Mayo.
†Blackwater Bank Lightship.
§*Burnmouth, Ayton, Berwick.
*Burntisland.
†Carnarvon Bay Lightship.
§*Cleggan, Co. Galway.
†Coningbeg Lightship.
§*Cromarty.
†Daunts Rock Lightship.
§[1] Eastbourne.
†East Goodwin Lightship.
†English and Welsh Grounds Lightship.
†Fastnet Rock Lighthouse.
[2] Holyhead Harbour Office.
§*Kirkwall.
†Kish Bank Lightship.
§*Lamlash, Isle of Arran.
†Leman and Ower Lightship.
§*Lerwick.
*Liscannor, Co. Clare.
§[3] Margate.
†Morecambe Bay Lightship.
†Newarp Lightship.
§*Newquay, Cornwall.
†North Arklow Lightship.
*North Arran (*see* Arran).
†North-West Lightship.
†Outer Dowsing Lightship.
†Owers Lightship.
§*Pennan Bay (Aberdour).
§[4] Plymouth.
§[5] Port Erin.
*Portrush.

The observers are indicated thus:—* Coastguard, † Lightkeepers, [1] S. R Henderson, [2] F. M. Cotton, C.E., [3] W. J. Woodruff, [4] H. Victor Prigg, [5] Biological Station.

§ Stations marked thus send weekly returns for publication in the Weekly Weather Report.

LIST OF SEA TEMPERATURE STATIONS—*continued.*

†Royal Sovereign Lightship.
*St. Ann's Head, Pembroke.
§*Salcombe, Devon.
§*Scarborough.
* Scilly Islands (St. Mary's).
§*Seafield, Co. Clare.
†Seven Stones Lightship.
†Shambles Lightship.
§*Sheephaven (Dunfanaghy).
§†Shipwash Lightship.
†Skulmartin Lightship.
†Smith's Knoll Lightship.
†Solway Lightship.
†South Arklow Lightship.
†South Rock Lightship.
†Spurn Lightship.
*Stornoway.
*Sunderland.
§*Teelin, Co. Donegal.
*Usan (Montrose).
†Varne Lightship.
§ Wick.

The observers are indicated thus :—* Coastguard, † Lightkeepers.

§ Stations marked thus send weekly returns for publication in the Weekly Weather Report.

List of Stations in the Colonies and Dependencies and in Foreign Countries from which Returns are received in Manuscript.

Note.—Returns received in printed form are not included in this list.

Station.	Latitude.	Longitude.	Height in Feet above M.S.L.	Order of Station.	Year of Commencement of Observations.	Observer.
Mediterranean.	° ′	° ′				
Cyprus,* ‡Famagusta	35 7 N.	33 57 E.	34	II	1881	The Chief Medical Officer.
,, ‡Kyrenia	35 21 N.	33 19 E.	54	II	1881	
,, ‡Larnaca	34 55 N.	33 37 E.	19	II	1881	
,, ‡Limassol	34 40 N.	33 1 E.	26	II	1881	
,, ‡Nicosia	35 11 N.	33 22 E.	493	II	1881	
,, ‡Papho	34 46 N.	32 25 E.	202	II	1881	
Gibraltar	36 6 N.	5 21 W.	48	II	1883	Colonial Secretary's Department.
Morocco, ‡Cape Spartel	35 47 N.	5 55 W.	191	II	1893	Edwin C. Hathaway, for Lloyds.
,, Mogador	31 30 N.	9 42 W.	19	●	1903	H. B. Johnstone, H.B.M. Vice-Consul.
,, Saffi	†32 17 N.	9 8 W.	40	●	1905	N. A. de Silva.
Syria, Beyrout	33 54 N.	35 28 E.	172	II	1883	Abdullah Kasir and Zeki M. Heikal for the Director of the Syrian Protestant College.
,,				● §		
Turkey, Smyrna	38 26 N.	27 9 E.	50	III	1908	H. Echiboukdjian, for the President, International College.
Africa.						
Central :—						
Uganda, Bombo	0 34 N.	32 36 E.	—	III	1911	M. T. Dawe, Director of the Scientific Department.
,, Entebbe	0 4 N.	32 28 E.	3,863	III	1896	
,, Fort Portal	0 43 N.	30 8 E.	5,299	III	1901	
,, Gondokoro	4 51 N.	31 42 E.	1,500	III	1901	
,, Gulu	3 18 N.	33 34 E.	—	III	1911	
,, Jinja	0 26 N.	33 11 E.	3,722	III	1901	

* By arrangement with the Colonial Office and the Survey Department of Egypt the returns for these stations are sent in the first instance to the Survey Department for use in connexion with its Monthly Weather Report. They are sent to the Office for ultimate filing.

† The positions and heights of the stations are those given by the observers, except in cases marked †, for which the information given has been obtained from other sources.

‡ The Meteorological instruments in use at this Station are lent by the Meteorological Committee.

§ 9 Rainfall Stations.

Maifoni (Maiduguri)	11	48	N.	13	12	E.	1,200	III	1907	
Sokoto	13	1	N.	5	14	E.	1,160	III	1907	The Secretariat, Zungeru.
Yola	9	12	N.	12	30	E.	850	III	1907	
Zaria	11	6	N.	7	43	E.	2,230	III	1907	
Zungeru	9	49	N.	6	10	E.	530	III	1907	
Sierra Leone	8	30	N.	13	9	W.	179	II	1895	The Principal Medical Officer.
Southern Rhodesia :—										
Ringstead Reef (Essexvale)	20	0	S.	29	0	E.	4,496	●	1908	Mrs. C. E. Fripp.
Somaliland—										
Berbera	10	22	N.	45	2	E.	30	III	1908	
Sheik Camp Hospital	9	50	N.	45	16	E.	4,500	III	1908	
Zaila		—			—		—	III	1910	A. W. Soffy.
SOUTH AMERICA.										
British Guiana, Georgetown	6	49	N.	58	8	W.	0	⊙	1906	
„ „ Mazaruni (Penal Settlement).		—			—		—	⊙	1908	F. A. Stockdale, Government Botanist.
Venezuela, Guayanavièjà (El Perú) ...	7½	0	N.	62	0	W.	1,000 ?	II B ⊖	1910	Dr. E. H. Griffen, for the Goldfields of Venezuela, Ltd.
CHINA.										
Chinkiang	32	13	N.	119	27	E.	40	II ⊙	1905	Capt. Lewis H. Tamplin.
NORTH ATLANTIC OCEAN.										
Bermuda Dockyard	32	20	N.	64	51	W.	30	—	1889	Lieut. F. J. Evans, R.N.
Bahamas, Nassau	†25	2	N.	77	25	W.	—	III	1895	R. W. D. Albury.
„ ‡*Abaco	25	51	N.	77	11	W.	75	II	1859	S. W. Roberts
„ ‡*Cay Lobos	22	22	N.	77	35	W.	—	II	1877	G. C. Pinder
„ ‡*Cay Sal	23	42	N.	80	25	W.	40	II	1859	G. L. Rodgers
„ ‡*Inagua	20	56	N.	73	41	W.	40	II	1871	E. J. Jones
„ ‡*Watling's Island	24	8	N.	74	26	W.	120	II	1889	T. R. Thompson
										Lightkeepers, for Board of Trade.
Barbados	†13	12	N.	59	35	W.	181	II	1895	John R. Bovell, Superintendent Botanical Department.
‡*Sombrero	18	36	N.	63	28	W.	34	II	1867	A. L. Richardson, Lightkeeper, for the Board of Trade.

* Lighthouse; contributes register containing observations every 4 hours.

† The positions and heights of the stations are those given by the observers, except in cases marked †, for which the information given has been obtained from other sources.

‡ The Meteorological instruments in use at this Station are lent by the Meteorological Committee.

LIST OF STATIONS in the COLONIES, &c., from which RETURNS are received in MANUSCRIPT—*continued.*

Station.	Latitude.	Longitude.	Height in Feet above M.S.L.	Order of Station.	Year of Commencement of Observations.	Observer.
AFRICA—*continued.*						
Central—*continued.*	° ′	° ′				
Uganda, Kampala	0 19 N.	32 35 E.	3,905	III	1907	M. T. Dawe, Director of the Scientific Department. Returns have been received also from 24 stations in Uganda which record rainfall only.
„ Kawolongoja	0 24 N.	32 11 E.	4,263	III	1910	
„ Kivuvu Kyagwe	0 23 N.	32 47 E.	? 3,650	III	1910	
„ Masaka	0 21 S.	31 47 E.	? 4,200	III	1902	
„ Masindi	1 40 N.	31 50 E.	3,764	III	1906	
„ Mbale	1 2 N.	34 6 E.	? 4,000	III	1907	
„ Mbarara	0 31 S.	30 47 E.	4,500	III	1901	
„ Nimule	3 39 N.	32 10 E.	2,034	III	1903	
West :—						
Gold Coast, Aburi	5 50 N.	0 10 W.	556	III	1893	Medical Department, Accra.
„ Accra	†5 35 N.	0 6 W.	60	III	1893	
„ Addah	5 50 N.	0 38 E.	—	III	1895	
„ Axim	†4 50 N.	2 12 W.	—	III	1895	
„ ‡Cape Coast Castle ...	†5 15 N.	0 30 W.?	—	III	1895	
„ Gambaga	†10 31 N.	0 26 W.	—	III	1899	
„ Kintampo	8 5 N.	1 30 W.	—	III	—	
„ Kumasi (Coomassie) ...	†6 50 N.	2 16 W.	859	III	1899	
„ Kwitta (Keta)	†5 59 N.	0 59 E.	—	III	1895	
„ Sekondi	5 0 N.	1 40 W.	20	III	1904	
„ Sunyani	7 22 N.	2 19 W.	—	III	1908	
„ Tamale	9 23 N.	0 50 W.	—	III	1908	
„ Tarkwa (Tarquah) ...	5 11 N.	2 0 W.	245	III	1907	
Northern Nigeria :—						
Bauchi	10 17 N.	9 49 E.	2,300	III	1907	The Secretariat, Zungeru.
Geidam (Dumjeri)	12 53 N.	11 57 E.	? 900	III	1907	
Ilorin	8 29 N.	4 32 E.	968	III	1907	
Kano	12 0 N.	8 33 E.	2,000	III	1907	
Katagum	12 17 N.	10 22 E.	108	III	1907	
Keffi	8 50 N.	7 52 E.	—	III	1907	
Kontagora	10 24 N.	5 24 E.	1,300	III	1907	

Lokoja	7	48 N.	6	44 E.	270	III	1907	The Secretariat, Zungeru.
Maifoni (Maiduguri)	11	48 N.	13	12 E.	1,200	III	1907	
Sokoto	13	1 N.	5	14 E.	1,160	III	1907	
Yola	9	12 N.	12	30 E.	850	III	1907	
Zaria	11	6 N.	7	43 E.	2,230	III	1907	
Zungeru	9	49 N.	6	10 E.	530	III	1907	
Sierra Leone	8	30 N.	13	9 W.	179	II	1895	The Principal Medical Officer.
Southern Rhodesia :—								
Ringstead Reef (Essexvale)	20	0 S.	29	0 E.	4,496	●	1908	Mrs. C. E. Fripp.
Somaliland—								
Berbera	10	22 N.	45	2 E.	30	III	1908	
Sheik Camp Hospital	9	50 N.	45	16 E.	4,500	III	1908	
Zaila		—		—	—	III	1910	A. W. Soffy.
SOUTH AMERICA.								
British Guiana, Georgetown	6	49 N.	58	8 W.	0	⊙	1906	F. A. Stockdale, Government Botanist.
" " Mazaruni (Penal Settlement).		—		—	—	⊙	1908	
Venezuela, Guayanaviéjà (El Perú) ...	7½	0 N.	62	0 W.	1,000 ?	II B Θ	1910	Dr. E. H. Griffen, for the Goldfields of Venezuela, Ltd.
CHINA.								
Chinkiang	32	13 N.	119	27 E.	40	II ⊙	1905	Capt. Lewis H. Tamplin.
NORTH ATLANTIC OCEAN.								
Bermuda Dockyard	32	20 N.	64	51 W.	30	—	1889	Lieut. F. J. Evans, R.N.
Bahamas, Nassau	†25	2 N.	77	25 W.	—	III	1895	R. W. D. Albury.
" ‡*Abaco	25	51 N.	77	11 W.	75	II	1859	S. W. Roberts
" ‡*Cay Lobos	22	22 N.	77	35 W.	—	II	1877	G. C. Pinder
" ‡*Cay Sal	23	42 N.	80	25 W.	40	II	1859	G. L. Rodgers
" ‡*Inagua	20	56 N.	73	41 W.	40	II	1871	E. J. Jones
" ‡*Watling's Island	24	8 N.	74	26 W.	120	II	1889	T. R. Thompson
								Lightkeepers, for Board of Trade.
Barbados	†13	12 N.	59	35 W.	181	II	1895	John R. Bovell, Superintendent Botanical Department.
‡*Sombrero	18	36 N.	63	28 W.	34	II	1867	A. L. Richardson, Lightkeeper, for the Board of Trade.

* Lighthouse; contributes register containing observations every 4 hours.

† The positions and heights of the stations are those given by the observers, except in cases marked †, for which the information given has been obtained from other sources.

‡ The Meteorological instruments in use at this Station are lent by the Meteorological Committee.

List of Stations in the Colonies, &c., from which Returns are received in Manuscript—*continued.*

Station.	Latitude.	Longitude.	Height in Feet above M.S.L.	Order of Station.	Year of Commencement of Observations.	Observer.
South Atlantic Ocean.	° ′	° ′				
Falkland Islands :—						
*‡Cape Pembroke	51 41 S.	57 42 W.	70	II	1859	J. Pearce, Lightkeeper, for the Board of Trade.
‡Stanley...	—	—	—	⊙ B	—	His Excellency the Governor.
‡St. Helena; St. Matthew's Vicarage ...	16 0 S.	5 40 W.	1,887	II	1885	A. L. C. Hands.
„ Central, Oak Bank ...	—	—	1,696	●	1902	J. Homagee.
„ St. Paul's Vicarage ...	—	—	1,694	●	1905	Alfred Porter.
South Georgia, Grytviken	54 14 S.	36 33 W.	10	II	1906	R. MacDougall, for the Argentine Fishery Company, transmitted by the Governor of the Falkland Islands through the Board of Trade.
Pacific Ocean.						
British Solomon Islands :—						
Tulagi	9 5 S.	160 8 E.	7	III	1907	F. J. Barnett.
Fiji :—						
Suva	18 8 S.	178 0 E.	44	II	1906	C. H. Knowles, Superintendent Department of Agriculture.
Fanning Island	3 54 N.	159 23 W.	—	III	1903	The Pacific Cable Board.
Malden Island	3 59 S.	155 0 W.	—	II	—	C. Karlson and P. E. Usher.
‡Ocean Island	0 52 S.	169 36 E.	91	II B.	1905	J. S. Marsh, for the Pacific Phosphate Company.
Indian Ocean.						
Madagascar :—						
Antananarivo	18 55 S.	47 30 E.	—	●	1903	T. P. Porter, H.B.M. Consul.
Mauritius, Royal Alfred Observatory ...	20 6 S.	57 31 E.	181	(I)	1901	T. F. Claxton, Director.

* Lighthouse; contributes register containing observations every 4 hours.
‡ The Meteorological instruments in use at this Station are lent by the Meteorological Committee.

K.—List of Publications Issued under the Authority of the Meteorological Committee of the Royal Society (1867 to 1876), the Meteorological Council (1877 to 1905), or the Meteorological Committee appointed by Treasury Minutes, May 20th, 1905, and 31st March, 1910.*

The list is arranged under the following headings :—

1. Reports of the Meteorological Office and of International Meetings.
2. Observations and Data for Stations in the United Kingdom.
3. Observations and Data for Colonial and Foreign Stations.
4. Marine Meteorology, Atlases and Memoirs.
5. Reports of Investigations in Dynamical and Statistical Meteorology and other Memoirs. Geophysical Memoirs.
6. Handbooks, Text-books and Tables.

1. Reports of the Meteorological Office and of International Meetings.

(P) Reports of the *Meteorological Committee* of the Royal Society (8vo.) :—
1867–1877. At prices varying from 4*d.* to 1*s.* per Report, except 1876–1877, 3*s.* 5*d.*

(P) Reports of the *Meteorological Council* (8vo.) :—
1878-1905. At prices varying from 5*d.* to 1*s.* 5*d.*, except 1884–5, 4*s.* 4*d.*

(P) Reports of the *Meteorological Committee* (8vo.) :—
1905–06 to 1911–12. Prices from 1*s.* 4*d.* to 2*s.* 3*d.*

International Codex of Resolutions adopted at Congresses, Conferences, and at Meetings of the Permanent International Committee 1872-1907 (No. 200). 1*s.* 3*d.* (8vo.)

Reports of Proceedings at International Meetings (8vo.). (Prices ranging from 6*d.* to 3*s.*) :—

1872. Leipzig Conference.
1873. Vienna Congress. Protocols and Appendices.
— Report on Weather Telegrapy and Storm Warnings.
— Report on Atmospheric Electricity, Maritime Meteorology, Weather Telegraphy.
1873 and 1874. Vienna and Utrecht.
1874. London. Maritime Meteorology.
1876. London. Second Meeting. Permanent Meteorological Committee.
1878. Utrecht. Third Meeting „ „ „
1879. Rome Congress.
1880. Berne. First Meeting. International Meteorological Committee.
1882. Copenhagen. Second Meeting of Committee.
1885. Paris. Third „ „
1888. Zürich. Fourth „ „
1891. Munich. First Conference.
1894. Upsala. Fifth Meeting of Committee.
1896. Paris. Second Conference.
1899. St. Petersburg. Sixth Meeting of Committee.
1903. Southport. Seventh „ „

* Unless otherwise indicated the publication is by the authority of the Meteorological Committee or its predecessors. (P) signifies a Parliamentary publication on sale by the Parliamentary Booksellers; (A) an Admiralty publication on sale by J. D. Potter, from whom the Monthly Meteorological Charts can also be obtained. Publications marked (¶) are on sale by the publishers named in the titles; those marked (M) are on sale only at the Meteorological Office. The remaining publications are on sale by Messrs. Wyman & Sons, Limited, and other agents for the sale of the publications of H.M. Stationery Office.

1. Reports of the Meteorological Office and of International Meetings —*continued.*

Reports of Proceedings at International Meetings, &c.—*continued.*

1905. Innsbruck. Third Conference.
1907. Paris. Eighth Meeting of Committee.
1909. London. Weather Telegraphy Commission.
1909. London. Maritime Weather Signals Commission.
— London. " " " Summary of Signals in use
1910. Berlin. Ninth Meeting of Committee.

2. Observations and Data for Stations in the United Kingdom.

(M) *Daily Weather Report*, including Meteorological Observations for 7 a.m. and 6 p.m. at 30 stations, and supplementary data from about 40 additional stations in the British Isles, together with data from 40 foreign stations, and Weather Charts of North-Western Europe and the Eastern Atlantic. Issued daily, post free, to any address in the United Kingdom for 5*s.* per official quarter. (4to.)

*British Meteorological and Magnetic Year Book from 1908. (4to.)
Part I.—†*Weekly Weather Report.* 6*d.* per week. With Appendices priced separately.
Part II.—*Monthly and Annual Supplements:* Monthly Weather Report: summaries of observations from about 250 stations in the British Isles, and charts. 6*d.* each part. Subscription for Parts I. and II. inclusive, including postage, 30*s.* per annum.

(M) Part III.—(1) *Daily Readings* at 16 meteorological stations of the First and Second Orders. 1*s.* per issue of a month. Annual Volume 10*s.* 6*d.*

(2) *Geophysical Journal*, comprising daily values in C.G.S. units of meteorological and magnetical data for the three Meteorological Office Observatories—Valencia, Kew, and Eskdalemuir; Electrical data for Kew and Eskdalemuir; Seismological data for Eskdalemuir; wind components for Holyhead, Scilly, Orkney, and Yarmouth; and supplements giving the results of observations in the upper air. 4*d.* per issue of a month. Annual issue, 5*s.*

(M) Part IV.—(1) *Hourly values* in C.G.S. units from autographic records; Meteorological Section: Hourly values of the meteorological elements at the three Meteorological Office Observatories—Valencia, Kew, and Eskdalemuir. 6*d.* per issue of a month for each Observatory.

(2) *Hourly values* in C.G.S. units from autographic records; Geophysical Section: Hourly Readings of Terrestrial Magnetic Force at Eskdalemuir; with diurnal inequalities for terrestial magnetism and atmospheric potential gradient, and monthly and annual summaries of hourly values of meteorological and geophysical data at the Meteorological Office Observatories. Annual issue. Price not yet ascertained.

Monthly Weather Reports (4to):—
1884–1887.‡ In Monthly Parts 1*s.* 6*d.* to 2*s.* 6*d.* each, except May to December, 1887, which is in wrapper, price 12*s.*

Quarterly Weather Report (4to):—
1869–1880. At prices varying from 4*s.* to 10*s.* each Quarterly Part.
1877–1880:—Appendices and Plates are published for these years at 27*s.* or 28*s.* per Yearly set.

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* The publication of Geophysical data (terrestrial magnetism, atmospheric electricity, seismology and solar radiation) for the Observatories Kew, Eskdalemuir, Falmouth and Valencia, began in Parts III. and IV. of the Year Book as from Jan., 1911. The title of the publication from 1908 to 1910 was "The British Meteorological Year Book."

† The publication of the Weekly Weather Report began in February, 1878. Annual subscription, including Supplements and Appendices, post paid, 1878–1883, 12*s.* 6*d.*; 1884–1888, 21*s.* 2*d.*; 1889–1911, 30*s.*

‡ The publication of the Monthly Weather Report was continued after 1887 as a Supplement to the Weekly Weather Report.

2. Observations and Data for Stations—*continued.*

**Hourly Readings* from the Self-Recording Instruments at the . . . . Observatories (4to) :—

1881–1886. In Parts, varying in price from 10*s.* to 30*s.* each.
1900–1910. 25*s.* each, or 6*d.* per month each station. (*Continued under* British Meteorological and Magnetic Year Book. Part IV.)

Hourly Means (*for Five-days and Calendar months*) of the Readings obtained from the Self-Recording Instruments at the . . . Observatories under the Meteorological Council (4to) :—

1887–1899. In Annual Volumes, at prices varying from 15*s.* to 38*s.*

Meteorological Observations at Stations of the Second Order (4to) :—

†1876–1907. At prices varying from 20*s.* to 35*s.*
1908–1910, 16*s.* each.
(*Continued under* British Meteorological and Magnetic Year Book. Part III.)

(**M**) *Geophysical and Meteorological Observations* for 1910 at Kew, Falmouth, Eskdalemuir and Valencia Observatories. 1*s.* 6*d.*

AVERAGES :—

Quinquennial table of averages of Temperature, Rainfall, and Sunshine at Stations in the British Isles. Latest issue, for the period ended 1905 (about 150 Stations). 1*s.* (4to.) Forms Appendix III. to Weekly Weather Report, 1906.

Rainfall :—

Diurnal Range of Rain at the Seven Observatories in connexion with the Meteorological Office, 1871–1890. (No. 143. 1900.) 2*s.* 6*d.* (8vo.)
Rainfall Tables of the British Isles for 1866–80. Compiled by G. J. Symons, F.R.S. (No. 47. 1883.) 7*s.* 6*d.* (8vo.)
Rainfall Tables of the British Islands, 1866–90. (No. 114. 1897.) 6*s.* (8vo.)

Sunshine :—

Sunshine Records of the United Kingdom for 1881. (No. 56. 1883.) 4*s.* (8vo.)
Ten Years' Sunshine in the British Isles, 1881–90. (No. 98. 1891.) 2*s.* (8vo.)

Temperature :—

Temperature Tables for the British Islands. (No. 154. 1902.) 10*s.* 6*d.* Supplement :—Difference Tables for each Five Years for the Extrapolation of Mean Values. 3*s.* (4to.)

ATLAS :—

Meteorological Atlas of the British Isles. (No. 53. 1883.) 5*s.* 6*d.* (4to.)

3. Observations and Data for Colonial and Foreign Stations.

Contribution to the Meteorology of Japan.—By Staff-Com. Thomas H. Tizard, H.M.S. "Challenger." (No. 28. 1876.) [Out of Print.]
Meteorological Observations at the Foreign and Colonial Stations of the Royal Engineers, and the Army Medical Department, 1852–1886. (No. 83. 1890.) 23*s.*
Meteorological Observations made at Sanchez, Samaná Bay, St. Domingo, 1886–1888.—By the late W. Reid, M.D. (No. 89. 1890.) 8*s.* 6*d.*
Report on the Meteorology of Kerguelen Island.—By Rev. S. J. Perry, S.J., F.R.S. (No. 37. 1879.) 3*s.*
Climatological Observations at Colonial and Foreign Stations :—
I. :—Tropical Africa, 1900–1902, with Summaries and Map.—By E. G. Ravenstein, F.R.G.S. (No. 165. 1904.) 6*s.* (4to.)

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* For the years 1874–1880 the Hourly Readings were issued in lithographed form. Price 20*s.* per annum. Hourly Readings for Kew and Valencia are published also for the years 1895–1899 in the corresponding volumes of "Hourly Means."

† The Observations at Stations of the Second Order for 1873–75 will be found in the Quarterly Weather Report for the respective years.

4. Marine Meteorology, Atlases and Memoirs.

CHARTS :—

Arabian Sea :—

Daily Weather Charts for the period of six weeks ending June 25, 1885, to illustrate the tracks of two cyclones in the Arabian Sea. (No. 80. 1891.) 10*s.* (4to.)

Atlantic :—

Charts of Meteorological Data for the Nine 10° Squares of the Atlantic, which lie between 20° N. and 10° S., and extend from 10° to 40° W., with accompanying Remarks, ending with the Best Routes across the Equator. (No. 27. 1876.) 24*s.* (17 × 20 ins.)

(A) Monthly Current Charts for the Atlantic Ocean. From information collated and prepared in the Meteorological Office. (No. 132. 1897). 10*s.* (22½ × 18 ins.)

Atlantic (North) :—

Charts of Meteorological Data for Square 3, Lat. 0°–10° N., Long. 20°–30° W. (20 × 13½ ins.) and Remarks to accompany the Monthly Charts, which show the Best Routes across the Equator for each Month, &c. (17 × 16½ ins.) (No. 20. 1874.) 20*s.*

Charts illustrating the Weather of the North Atlantic Ocean in the Winter of 1898–99. (No. 142. 1901.) 6*s.* 6*d.* [Out of Print.]

Currents and Surface Temperature of the North Atlantic Ocean, from the Equator to Latitude 40° N., for each Month of the Year. With a General Current Chart. (No. 12. 1872.) 2*s.* 6*d.* (4to.)

Discussion of the Meteorology of that Part of the Atlantic lying North of 30° N., for the eleven days ending 8th February, 1870. With Charts. (No. 13. 1872.) 5*s.* (4to.)

Meteorology of the North Atlantic during August, 1873, with 31 Synoptic Charts. (No. 32. 1878.) With book of Charts, 15*s.* (15 × 22 ins.)

Synchronous Weather Charts of the North Atlantic and the adjacent Continents, 1st August, 1882, to 3rd September, 1883. Parts I. to IV. (33 sheets each). (No. 71. 1886.) 17*s.* each Part. (26 × 22 ins.)

Atlantic (South) :—

Charts showing the Surface Temperature of the South Atlantic Ocean in each month of the Year. (No. 4. 1869.) 2*s.* 6*d.* (18½ × 12½ ins.)

(A) Wind Charts for the Coastal Regions of South America, from information collated and prepared in the Meteorological Office. (No. 159. 1902.) 7*s.* (27 × 20½ ins.)

(A) Monthly Wind Charts of the South Atlantic. (No. 168. 1903.) (20 × 27 ins.) 6*d.* each.

The relation between Pressure, Temperature, and Air Circulation over the South Atlantic Ocean. By M. W. Campbell Hepworth, C.B., Commander R.N.R., Marine Superintendent. (No. 177. 1905.) 9*d.* (8vo.)

Atlantic, Indian, and Pacific Oceans :—

Charts showing the Surface Temperature of the Atlantic, Indian, and Pacific Oceans. (No. 59. Second Edition, 1903.) 4*s.* 6*d.* (19¼ × 14½ ins.)

Charts showing the Mean Barometric Pressure over the Atlantic, Indian, and Pacific Oceans. (No. 76. 1887.) 10*s.* 6*d.* Supplementary Chart. 6*d.* (27 × 20¾ ins.)

Atlantic (North) and Mediterranean :—

Monthly Meteorological Charts, commencing April, 1901. (No. 149.) 6*d.* each. Subscription for one year, 5*s.* (exclusive of postage). (22 × 30 ins.)

Indian Ocean :—

(A) Monthly Current Charts for the Indian Ocean, from information collated and prepared in the Meteorological Office. (No. 124 1896.) 7*s.* (20 × 24½ ins.)

4. Marine Meteorology, &c.—*continued.*

CHARTS—*continued.*

Indian Ocean—continued.

Monthly Meteorological Charts of the Indian Ocean and Red Sea. Commencing May, 1906. (No. 181.) 6*d.* each. Subcription for one year, 5*s.* (exclusive of postage). (1906–10, 30 × 22 ins., 1910–11, 30 × 30 ins., 1911–12, 30 × 22 ins.)

Indian Ocean (North) :—

Meteorological Charts of the portion of the Indian Ocean adjacent to Cape Guardafui and Ras-Hafûn. (No. 92. 1891.) 6*s.* (17½ × 23½ ins.)

Indian Ocean (South) :—

Cyclone Tracks in the South Indian Ocean, from information compiled by Dr. Meldrum, C.M.G., F.R.S. (No. 90. 1891.) [Out of print.]*

Meteorological Charts for the Ocean District adjacent to the Cape of Good Hope, with accompanying Remarks. (No. 43. 1882.) Charts, 25*s.* Remarks, 7*s.* (19½ × 24 ins.)

Pacific Ocean :—

(A) Quarterly Current Charts for the Pacific Ocean, from information collated and prepared in the Meteorological Office. (No. 134. 1897.) 5*s.* (26½ × 28½ ins.)

(A) Wind Charts for the Coastal Regions of South America, from information collated and prepared in the Meteorological Office. (No. 159. 1902.) 7*s.* (27 × 20½ ins.)

Red Sea :—

Meteorological Charts of the Red Sea. (No. 106. 1895.) 21*s.* (22 × 13½ ins.)

Southern Ocean :—

Meteorological Charts of the Southern Ocean between the Cape of Good Hope and New Zealand. (No. 123. 1899.) [New Edition, 1907.] 6*s.* (17½ × 19½ ins.)

OTHER PUBLICATIONS ON MARINE METEOROLOGY :—

Contributions to our Knowledge of the Meteorology of the Arctic Regions. (Official, No. 34. 1885.) Vol. 1 : Part I., 2*s.*; II., 10*s.*; III., 6*s.*; IV., 5*s.*; V., 6*s.* (4to.)

Contributions to our Knowledge of the Meteorology of the Antarctic Regions. (No. 18. 1873.) 2*s.* (4to.)

Contributions to our Knowledge of the Meteorology of Cape Horn and the West Coast of South America. (No. 11. 1871.) 2*s.* 6*d.* (4to.)

Notes on the Form of Cyclones in the Southern Indian Ocean.—By C. Meldrum, M.A., F.R.S. (Non-Official, No. 7. 1873.) [Out of print.]

On the Physical Geography of the part of the Atlantic which lies between 20° N and 10° S. and extends from 10° to 40° W. A Paper read before the British Association at Bristol, in August, 1875.—By Capt. H. Toynbee, F.R.A.S. (Non-Official, No. 10. 1876.) [Out of print.]

On the Winds, &c., of the North Atlantic along the Tracks of Steamers from the Channel to New York. Translated from a Paper issued by the Deutsche Seewarte, Hamburg. (Non-Official, No. 5. 1872.) 6*d.* (8vo.)

Report to the Committee of the Meteorological Office on the Meteorology of the North Atlantic.—By Capt. H. Toynbee, F.R.A.S. (Non-Official, No. 2. 1869.) 1*s.* (8vo.)

Report on the Gales experienced in the Ocean District adjacent to the Cape of Good Hope between Lat. 30° and 50° S., and Long. 10° and 40° E.—By Capt. H. Toynbee, F.R.A.S. (No. 44. 1882.) 7*s.* 6*d.* (4to.)

Routes for Steamers from Aden to the Straits of Sunda and back. Translated from a Paper issued by the R. Meteor. Inst. of the Netherlands. (Non-Official, No. 4. 1872.) [Out of print.]

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* Reproduced upon the Meteorological Charts for the Indian Ocean (No. 181).

5. Reports of Investigations in Dynamical and Statistical Meteorology and other Memoirs.

London Fog Inquiry, 1901–03 :—

Report of the Council, with Report by R. G. K. Lempfert, M.A. 1904. (No. 160. 1904.) 2*s.* 6*d.* (4to.)

Report by Captain Alfred Carpenter, R.N., D.S.O. (1903.) 2*s.* (4to.)

DYNAMICAL METEOROLOGY :—

Report on the Storm of October 13–14, 1881.—By Robert H. Scott, F.R.S. (No. 46. 1882.) 1*s.* 6*d.* [Out of print.]

Report of an Inquiry into the Connexion between Strong Winds and Barometric Differences.—By Robert H. Scott. (Non-Official, No. 1. 1868.) 6*d.* (8vo.)

Report to the Committee of the Meteorological Office on the use of Isobaric Curves.—By Captain H. Toynbee, F.R.A.S. (Non-Official, No. 3. 1869.) [Out of print.]

Barometric Gradient and Wind Force. Report to the Director of the Meteorological Office by E. Gold, M.A., Fellow of St. John's College, Cambridge, Superintendent of Instruments. (No. 190. 1908.) Price 2*s.* 6*d.* (4to.)

Life History of Surface Air Currents. A Study of the Surface Trajectories of Moving Air.—By W. N. Shaw, Sc.D., F.R.S. (Director of the Meteorological Office) and R. G. K. Lempfert, M.A. (No. 174. 1906.) 7*s.* 6*d.* (4to.)

The Free Atmosphere in the Region of the British Isles. Contributions to the Investigation of the Upper Air. (No. 202. 1909.) Price 2*s.* 6*d.* (4to.)

STATISTICAL METEOROLOGY :—

The Beaufort Scale of Wind-force. Report of the Director of the Meteorological Office upon an Inquiry, with a Paper by G. C. Simpson, M.Sc., and Notes by Sir G. H. Darwin, K.C.B., F.R.S., W. H. Dines, F.R.S., and Commander Campbell Hepworth, C.B., R.N.R., Marine Superintendent. (No. 180. 1906.) 1*s.* 6*d.* (4to.)

Harmonic Analysis of Hourly Observations of Air Temperature and of Pressure at British Observatories. (No. 93. 1891.) 12*s.* (4to.)

The Trade Winds of the Atlantic Ocean. Contributions to the Study of the North-East and South-East Trade Winds. (No. 203. 1910.) Price 3*s.* (4to.)

(M) AERONAUTICS :—

Report on Wind Structure. (8vo.) (No. 1. 1909.) 4*s.*

" " " " (No. 2. 1910–11.) 1*s.*

From Reports of the Advisory Committee for Aeronautics.

(M) GEOPHYSICAL MEMOIRS (4to):—

Vol. I., Part I., for 1911 :—

1. The Effect of the Labrador Current upon the surface temperature of the North Atlantic; and of the latter upon air temperature and pressure over the British Isles. By M. W. Campbell Hepworth, C.B., R.D., Commander R.N.R., Marine Superintendent. (No. 210a 1912.) 9*d.*
2. The Free Atmosphere in the Region of the British Isles. Second Report by W. H. Dines, F.R.S., with a Preface by W. N. Shaw, Sc.D., F.R.S., Director. (No. 210b. 1912.) 1*s.*
3. Graphical Construction for the Epicentre of an Earthquake, by G. W. Walker, M.A., Superintendent of Eskdale Observatory. (No. 210c. 1912.) 3*d.*

Part II., for 1912 :—

4. On the Radiation Records obtained in 1911 at South Kensington, together with a comparison between them and the corresponding absolute observations of Radiation made at Kew Observatory, by R. Corless, M.A., Secretary to the Director. (No. 210*d*. 1912.) 3*d.*

6. Handbooks, Text-books, and Tables. (8vo.)

Barometer Manual. (No. 8. 1871.) [Out of Print.]

Barometer Manual for the Use of Seamen. A Text Book of Marine Meteorology. With an Appendix on the Thermometer, Hygrometer, and Hydrometer. Seventh Edition. [In the press.] (No. 61.) 3*d.*

Fishery Barometer Manual. New Edition, 1887. (No. 3.) 6*d.*

Instructions for Meteorological Telegraphy. New Edition, 1906. (No. 2.) Prepared for the use of Observers exclusively.

The Observer's Handbook. A new Edition of Dr. Scott's Instructions in the use of Meteorological Instruments. (No. 191.) Issued annually. 3*s.*

Hints to Meteorological Observers in Tropical Africa, with Instructions for taking Observations, and Notes on Methods of recording Lake Levels. Second Edition, revised 1907. (No. 162.) 9*d.*

(M) Hygrometrical Tables, based on Glaisher's Tables. 1904. 4*s.* 6*d.*

(¶) Tables for the reduction of Meteorological Observations, published by the Indian Meteorological Department. 2*s.*

FORECASTING :—

Aids to the Study and Forecast of Weather.—By W. Clement Ley, M.A. (No. 40. 1880.) 1*s.*

Principles of Forecasting by means of Weather Charts.—By the Hon. Ralph Abercromby, F.R.Met.Soc. Second Edition, Revised, 1885. (No. 60.) [Out of Print.]

(¶) **Forecasting Weather.—By W. N. Shaw, Sc.D., F.R.S. Constable and Co., Ltd. 12*s.* 6*d.***

L.—PUBLICATIONS OF THE INTERNATIONAL METEOROLOGICAL COMMITTEE.

INTERNATIONAL METEOROLOGICAL COMMITTEE :—

(¶) *International Meteorological Tables.* With introduction in French, English and German. Gauthier-Villars et Fils, Paris. (4to.) (1890.) 40*s.*

(¶) *International Cloud Atlas.*—By H. H. Hildebrandsson and L. Teisserenc de Bort. With introduction in French, English and German, and 14 coloured plates. Gauthier-Villars et Fils, Paris. (4to.) (Second Edition, 1910.) 10*s.*

INTERNATIONAL COMMISSION FOR SCIENTIFIC AERONAUTICS :—

Observations derived from International Ascents and from Mountain Stations, &c. 1904-1909. (4to.) £1 per year.

The prices of *Forms for Observers, Sunshine Cards*, &c., can be obtained on application.

APPENDIX III.

LIST of CAPTAINS who have sent in Logs classed as "Excelle during the year ending March 31, 1912. Figures are attacl to the name of each observer to show the number "Excellent" logs which he has supplied during the wh time of his co-operation with the Office.

Name of Captain.	Number of "Excellent" Logs.	Ship.
Bennett, C. D., R.D., Comm. R.N.R.	17	S.S. "Macedonia."
Collins, P. J.	1	S.S. "Marathon."
Gillman, L. B.	2	S.S. "Matatua."
Griffiths, A. M.	5	S.S. "Hillmere."
Grindlay, G.	3	S.S. "Crown of Arragon."
Haddock, R. L., Comm. R.N R. ...	1	S.S. "Mooltan."
Harris, G. H., Lieut. R.N.R. ...	19	S.S. "Gloucestershire."
Hutchison, J. S., R.D., Comm. R.N.R.	1	S.S. "Waipara."
Knox, W. H.	1	S.S. "Shadwell."
Lingham, W. G., F.R.A.S., F.R. Met Soc.	10	S.S. "Wakool." S.S. "Ballarat."
Linklater, T. B.	2	S.S. "Marere."
Mais, E.	4	S.S. "York Castle."
McClure, W. H.	1	S.S. "Garryvale."
Millington, G. A.	4	S.S. "Narrung."
Moodie, J.	5	S.S. "Camphill."
Mullan, F. C., F.R.G.S.	33	S.S. "Ramsay."
Rae, J. R.	1	S.S. "City of Calcutta."
Robin, E.	1	S.S. "Herefordshire."
Stanley, W.	3	S.S. "Derbyshire."
Steeves, T. G.	5	S.S. "Jason."
Tait, T. A.	1	S.S. "Collingham."
Taylor, L. F., Lieut. R.N.R. ...	3	S.S. "Singapore."

APPENDIX IV.

METEOROLOGICAL REGISTERS received during the Year 1911–12.

(1.)—*From the* ROYAL NAVY.—*Meteorological Logs* (7).

H.M. Ship	Commanding Officer.	Officers Observing.	No. of Registers received.	Duration of Observations. Mths.	Days.	Voyage.
"Cornwallis," H.M.S.	R. H. Anstruther, Capt. R.N., C.M.G.	Lieut. C. D. C. Shakespear, R.N.	1	1	14	Mediterranean Station.
"Fantome," H.M.S. ...	J. D. Nares, Lieut. and Commr. R.N.	Sub-Lieut. J. G. Bowles, R.N.	1	5	20	Surveying, N.W. Australia.
"Merlin," H.M.S. ...	B. O. M. Davy, Commr. R.N.	Sub-Lieut. H. V. Silk R.N.	1	7	0	Surveying, British North Borneo.
"Mutine," H.M.S. ...	E. C. Hardy, Capt. R.N.; J. A. Edgell, Lieut. R.N.	Lieut. T. Lundholm, R.N.; Sub-Lieut. G. K. Rylands, R.N.	4	12	14	Surveying, West Coast of Africa.

(2.)—SPECIAL SERVICE.—*Uncommissioned Ships* (1).

"Worcester." H.M.S.	D. Wilson Barker, Commr. R.N.R., F.R.S.E., F.R.A.S., &c.	Cadets	1	3	28	Moored off Greenhithe, Kent.

Meteorological Registers received during the Year 1911-12 *continued.*

(3.) *From the* Mercantile Marine. *Meteorological Logs* (M.O.).

Ship.	Captain.	Officers Observing	No. of Registers received	Duration of Observations	Voyage
				Mths. Days	
"African Prince," S.S.	C. B. Andersson ...	H. O. Jefferson	3	0 10	New York-Rio Janeiro
"Amazon," S.S. ...	H. Doughty	... ...	1	3 0	Portsmouth-...
"Apollo," S.S. ...	H. W. Reay	A. Jones, J. L. Williams, G. Sinclair	1	0 0	Mauritius, China, W.I., W. coast A., and Cape and Magellan
"Arabic," S.S. ...	W. Finch, Lieut. R.N.R.	A. Tyrer, Sub-Lieut. R.N.R., H. K. Irving, Sub-Lieut. R.N.R., J. Morrow, H. M. Porter, Lieut. R.N.R.	3	0 23	New York
"Ariosto," S.S. ...	H. Bradley	E. Hall	1	3 10	Kawaihi, and Suez
"Arctic Stream," Ship	C. C. Dixon	H. V. Rogers, A. G. Bray	1	0 24	West Coast of America
"Armadale Castle," S.S.	John Tyson ... / S. C. Brown ...	H. Ray, E. Calder, W. L. Wilson, H. M. Rogers, J. R. Strange, Sub-Lieut. R.N.R., C. W. Smith, F. Smith, C. H. Pilkington, A. W. Bigsworth, Sub-Lieut. R.N.R.	3	4 10	Cape Town.
"Asuncion de Larrinaga," S.S.	J. V. de A. Echevarria / Ernest Fox ...	E. Fox, D. de Arriandiaga	1	7 10	East and West Coasts of N. and S. America
"Athenic," S.S. ...	C. H. Kempson, Lieut. R.N.R.	E. K. Irving, Sub-Lieut. R.N.R., P. A. Bell, S. B. Page, G. Fowler.	5	0 28	New Zealand, and Cape
"Avon," S.S.	L. R. Dickinson / J. Pope	... ...	1	4 18	River Plate, New York, West Indies.
"Ballarat," S.S. ...	W. G. Lingham, F.R.A.S., F.R. Met. Soc.	C. Lay, A. E. Stephens, E. Holmes	1	4 5	Australia, and U.S.A.
"Balmoral," Barque	C. Johnson	... ...	1	4 4	Oregon.
"Banca," S.S. ...	A. Collyer	L. M. Kelly, J. E. Genge, Sub-Lieut. R.N.R., — Fitzpatrick.	2	2 19	Bombay and Calcutta, and Suez.
"Baron Minto," S.S....	T. Baillie	T. H. Johnson, E. T. Davies, J. Carr ...	2	5 18	Rio, New York, China, Japan, and Suez.

"Baron Ogilvy," S.S.	H. H. Bridger	J. Brusher, T. Moore, J. Hooper, W. Murchison.	2	10 28	East Indies, Puget Sound, Japan, Rio, Florida, *viâ* Cape and Suez.
"Barranca," S.S. ...	S. H. Simmons	G. E. Martin, C. Hake, Sub-Lieut. R.N.R., H. S. Daniel, Mid. R.N.R.	2	6 26	Central America.
"Benvenue," S.S. ...	R. Kroble	C. F. Marsh, W. Murray, N. McLeod, J. H. Logan.	2	7 10	China, Japan, Bassein, *viâ* Suez.
"Blackwell," S.S. ...	T. W. Scurr	R. Mallett, E. Bush, J. E. Letbe	2	4 21	Calcutta, *viâ* Suez.
"Bostonian," S.S. ...	J. Parry	J. Trickey, J. Arkle, J. Davis, — Quick ...	2	7 10	U.S.A.
"Boyne," S.S. ...	S. G. Dale	A. Groom, S. Richards, T. Seabrook, A. E. Staples, V. Grantham.	1	3 21	Buenos Aires, Straits Settlements, Sumatra, and Java, *viâ* Suez.
"Braemar Castle," S.S.	S. Henderson, Lieut. R.N.R., R.D.	C. Vincent, S. Symons, H. Calder, Lieut., R.N.R., W. S. Colbourne, Sub-Lieut. R.N.R., H. A. Reed.	1	4 15	Alexandria, Capetown.
"Bucrania," S.S. ...	A. H. Raymer, Lieut. R.N.R.	E. E. Bulkeley, E. A. Winkworth, A. Maclurcan.	1	3 10	Beira, Australia, *viâ* C.G.H.
"Camphill," S.S. ...	John Moodie	J. Horne, J. Johnstone	2	7 9	Buenos Aires, New York and Australia, Valparaiso, *viâ* C.G.H. and Magellan.
"Canadian," S.S. ...	W. H. Bullock, Lieut. R.N.R.	T. B. Knight	1	3 19	Boston, U.S.A.
"Carlton," S.S. ...	A. Heron	R. P. Spoor, J. R. Harvey, C. Stokes ...	2	6 29	Monte Video, Karachi, Samarang, *viâ* Cape and Suez.
"Carpentaria," S.S. ...	E. G. Davis	A. Williams, A. Self, C. E. Parkes ...	2	6 28	Australia, *viâ* Suez.
"Catania," S.S. ...	A. S. Gibb, Lieut. R.N.R., R.D.	B. Southcott	2	8 2	Mediterranean, U.S.A., Canada.
"China," S.S. ...	E. Street	L. Unicume, A. Keith-Yates, T. C. A. Black, Mid. R.N.R., E. Wilder, G. P. Shaw, C. L. de Guerin, J. S. Harvey, Mid. R.N.R.	2	4 24	Australia, *viâ* Suez.
"Chirripo," S.S. ...	W. R. Rowe, F.R.Met. Soc.	E. A. Brown, T. N. Rodick, Sub-Lieut. R.N.R., R. C. Warren.	1	3 22	Santa Marta.
"Circassia," S.S. ...	C. F. Osborne, Commr. R.N.R., R.D.	W. Gemmell, — Cowan, F. W. Banks, A. S. Hannan, A. S. Anderson, A. Andrew, R. Spilsbury, C. Warltire.	2	7 2	Bombay, *viâ* Suez.
"City of Calcutta," S.S.	J. R. Rae	J. McArthur	3	6 8	East Indies, *viâ* Suez.
"City of Colombo," S.S.	Benjamin Dowse ...	R. R. Jones, L. Adams, C. Taylor	1	3 20	Philadelphia, Whampoa, Saigon, *viâ* Cape and Suez.

METEOROLOGICAL REGISTERS received during the Year 1911-12—*continued.*

(3.)—*From the* MERCANTILE MARINE.—*Meteorological Logs*—continued.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
				Mths. Days.	
"Clan Buchanan," S.S.	A. W. Simpson	D. Macfarlane, R. P. Elliot, Sub-Lieut. R.N.R., W. Beaton, V. S. Armstrong, D. Mackinnon, A. Randle, A. Henderson.	2	5 9	East Indies, *viâ* Cape and Suez.
"Clan Forbes," S.S. ...	R. G. Becket	M. McGowan, — Kilgour, — Allen, W. Shearer, — Burrington, C. V. Groves, F. Beresford.	3	7 13	East Indies, *viâ* Cape and Suez.
"Clan Lindsay," S.S.	A. Scotland	A. H. Young, J. R. Andrew, A. R. Hair, J. H. Bain.	2	5 21	East Indies, *viâ* Cape and Suez.
"Clan Macdougall," S.S.	W. H. Price	A. H. Young, H. Evans, H. Hughes, R. Davey.	1	3 18	Mauritius, Australia, *viâ* Cape and Suez.
"Clan Macfadyen," S.S.	W. Wright ... W. I. Mason, Lieut, R.N.R.	R. Mackie, S. B. Watson, A. L. Tessier, P. Macfarlane, Sub-Lieut. R.N.R., C. A. Cahill.	2	5 27	Zanzibar, Mauritius, East Indies, *viâ* Cape and Suez.
"Clan Macfarlane," S.S.	W. H. Price	D. MacKinnon, P. Hart, T. Hatton, Sub-Lieut. R.N.R., F. J. E. Houghton.	1	2 23	Mauritius, Bombay, *viâ* Cape and Suez.
"Clan Macintosh," S.S.	W. J. Lennox	F. J. Stenson, Lieut. R.N.R., H. E. G. Scott-Smith, Sub-Lieut. R.N.R., E. H. Saxton, H. S. Gage, Sub-Lieut. R.N.R., C. E. Williams, K. L. MacKenzie, Mid. R.N.R., E. W. Baker, — Lamble, — Barr, — Willoughby.	2	6 14	East Indies, *viâ* Cape and Suez.
"Clan Macleod," S.S.	A. R. Weir	H. Southward, J. Harley, W. Roberts, R. Leslie.	2	4 16	East Indies, *viâ* Suez.
"Clan Urquhart," S.S.	C. Sommerfelt	G. Niell, P. Macfarlane, J. R. Letts, — Jennings.	1	3 27	Australia, *viâ* Cape and Suez.
"Collingham," S.S. ...	T. A. Tait	W. F. Beavan, W. Yeatts, C. M. A. Smith ...	2	8 4	East and West Coasts of North and South America.

"Coulsdon," S.S. ...	I. M. Welford	A. Hudson-Scott	3	7 1	East and West Coasts of North America, *viâ* Magellan, Australia, East Indies and Home.
"Counsellor," S.S. ...	W. J. Simmons... ...	A. de Legh, G. R. Windsor, W. A. Hall, J. Gunson, W. Wilford.	1	4 2	East Indies, *viâ* Cape and Suez, U.S.A.
"Crown of Arragon," S.S.	G. Grindlay ... / Wm. Baird ...	D. M. Mâtheson, D. J. Thomson, D. McKinnon, J. R. Roberts, D. Cook, E. A. Brown.	2	5 18	South America, U.S.A., Canada, West Indies.
"Cuthbert," S.S. ...	W. Smale	A. Carpenter, D. Williams, F. Hempsted ...	1	2 21	East Coast of North and South America.
"Derbyshire," S.S.	W. Stanley ... / T. R. Blanchard	S. Makepeace, G. English, R. H. Wood, J. Morefield, C. E. Stone, L. Pirie, P. de Legh, C. Calvert, T. S. Veail, H. Giles.	4	7 28	Calcutta, Rangoon, *viâ* Suez.
"Diana," S.S. ...	A. E. Adams	J. McIntosh	1	6 8	Davis Strait and Baffins Bay (Whaling).
"Dominic," S.S.	J. Martin ... / J. A. Burns ...	G. Parry, W. Briscoe	2	7 19	East Coast of South America, New York.
"Dunbarmoor," S.S....	O. G. Owens	E. J. Collins, G. W. Watkins, R. Blake, — Blakey.	2	3 11	Bombay, *viâ* Suez, St. Vincent (C. V.), Huelva.
"Durham Castle," S.S.	T. Chope, Lieut. R.N.R.	A. O. Morgan, Lieut. R.N.R., — Lovegrove, H. Bergen, J. Densham, J. C. Brown, Lieut. R.N.R., H. Kershaw.	4	7 17	Delagoa Bay, *viâ* Cape.
"East Point," S.S. ...	H. J. Young	C. H. Bouch, J. Scott, R. Bailes	1	4 1	U.S.A.
"Egypt," S.S.	F. R. Summers... / D. Asbury ...	P. L. Sandberg, H. A. Monro, A. Martell ...	3	8 26	Bombay, *viâ* Suez.
"El Argentino," S.S.	W. R. Coleman... ...	F. B. Driscoll, A. H. Furlong, R. Loughnan, R. Irvine, A. J. Densham.	2	6 12	River Plate.
"Empress of China," S.S.	R. Archibald, Commr. R.N.R.	A. V. R. Lovegrove, Lieut. R.N.R., H. T. M. Watkins, Lieut. R.N.R., R.D., J. G. Watson, Lieut. R.N.R., D. J. Wade.	1	3 24	Trans-Pacific (North).
"Empress of India," S.S.	S. Robinson, Lieut. R.N.R. / E. Beetham, Lieut. R.N.R.	M. Mayall, E. P. Green, N. H. G. Montagnon, H. Caldwell, A. Hailey, C. H. Oxlade, H. James.	3	11 19	Trans-Pacific (North).
"Empress of Japan," S.S.	S. Robinson, Lieut. R.N.R. / F. L. Davison ... / H. Pybus, Commr. R.N.R.	A. H. Bird, Lieut. R.N.R., A. G. Gardiner, L. D. Douglas, Sub-Lieut. R.N.R., L. M. Goddard, F. Fleming, W. O. Hanlon, F. W. N. Higgins, Lieut. R.N.R., A. V. R. Lovegrove, Lieut. R.N.R., J. J. Hunt.	2	7 23	Trans-Pacific (North).

METEOROLOGICAL REGISTERS received during the Year 1911–12—*continued.*

(3.)—*From the* MERCANTILE MARINE.—*Meteorological Logs*—continued.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations. Mths.	Days.	Voyage.
"Fitzclarence," S.S....	J. H. Blair	W. E. Edwards, W. Haddow, A. H. Gardner, G. Morgan.	2	13	6	Rio, New York, China, Japan, *viâ* Cape and Suez, East and West Coasts of North America, and Australia, *viâ* Magellan.
"Fulwell," S.S.	G. C. Douglas ... / S. C. Smiles ...	H. R. Sharpe, W. L. Charlton, G. R. Taylor, J. W. Pettigrew, — Yates.	4	10	12	Calcutta, *viâ* Suez.
"Garryvale," S.S. ...	Wm. Hy. McClure ...	G. E. Patterson, J. W. D. Kearney	1	3	26	Rio Janeiro, India, *viâ* Cape.
"Georgic," S.S. ...	J. Roberts, Lieut. R.N.R.	W. H. G. Yates, G. Davey, Sub-Lieut. R.N.R., B. Behrman, H. H. McFadyen, T. Holmes.	2	6	1	Australia, *viâ* C.G.H.
"Glamorganshire," S.S.	H. C. Norris ... / J. M. Tomlinson	H. T. Angus, J. W. Maughan, E. E. Sharp, G. N. Cochran, W. C. Oxbrow.	1	3	15	China, Japan, *viâ* Suez.
"Glenaffric," S.S. ...	W. Lane	W. A. D. Nelson	1	4	12	Buenos Aires, Durban, Java, U.S.A., *viâ* Suez.
"Glenelg," S.S.	A. Hart ... ... / D. L. Muirhead...	D. L. Muirhead, W. Brooks, J. Macintyre, L. L. Lawerance, W. Irvine, A. K. Fleck, J. Gray.	2	6	22	South America, Australia, East Indies, *viâ* Cape and Suez.
"Glenshiel," S.S. ...	D. G. Griffiths	D. A. Addison, J. J. Jones, R. Lewis ...	1	6	7	East Coast of North and South America, Japan, Sabang, *viâ* Cape and Suez.
"Gloucestershire," S.S.	G. H. Harris, Lieut. R.N.R.	F. W. L. Midgley, C. E. Stone, C. Hill, — Speakman, G. English, — Kershaw, S. Makepeace, — Foster, P. de. Legh, C. Calvert.	4	8	1	Rangoon, *viâ* Suez.
"Gryfevale," S.S.	J. W. Steele ... / B. Collie... ...	B. Collie, G. P. Pearson, J. S. Campbell, D. Clinton, A. C. Davidson, R. A. Smith, A. McMillan.	3	9	28	River Plate, Australia, Japan, *viâ* Cape.
"Hangchow," S.S. ...	Gerald Byers	W. Tonkin, J. Pringle	1	3	4	Coasting, China.

"Herefordshire," S.S.	E. Robin...	H. Peterson, H. Bryce, R. H. A. Dunn, Sub-Lieut. R.N.R., J. Moffatt, T. S. Veall, M. I. Pirie, F. Deller.	8	6	5	Rangoon, *viâ* Suez.
"Hesione," S.S. ...	H. R. C. Lockyer ...	H. Duffries, W. Bebington, P. Capper ...	2	5	12	Monte Video.
"Hesperian," S.S. ...	W. S. Main, F.R.G.S. ...	... ...	1	3	25	Canada.
"Hillmere," S.S. ...	A. M. Griffiths	W. W. Hipkin, J. B. Robinson, W. J. Jones	2	7	14	River Plate, Durban, Australia, U.S.A., *viâ* Cape.
"India," S.S.... ...	G. W. Gordon, Lieut. R.N.R.	G. W. Taylor, Sub-Lieut. R.N.R., C. G. Gordon, G. R. Gilbert. Mid. R.N.R., C. W. Fisher, E. Huddy, W. Jackson, C. E. Lawther, Mid. R.N.R.	3	8	14	Australia, *viâ* Suez.
"Indian Monarch," S.S.	K. P. T. Wood	F. Ramsay, J. Gibson, A. Moffatt	2	5	2	Dakar, Monte Video, W.C.S.A., *viâ* Magellan, U.S.A.
"Ionic," S.S.	E. C. Roberts	C. Alexandre, A. E. Bowles, E. J. French ...	2	6	1	New Zealand, *viâ* Capes.
"Jason," S.S.... ...	T. G. Steeves	G. J. B. Rogers, J. H. Jones, C. R. Cooper ...	2	5	21	China, Australia, *viâ* Cape and Suez.
"Kaikoura," S.S. ...	A. W. McKellar, Commr. R.N.R.	H. J. Wilde, W. D. Croudace, F. P. Haines, R. R. Neale, — Hancock, — Clifford.	2	6	12	New Zealand, *viâ* Capes.
"Kaipara," S.S. ...	N. R. de la Cour Cornwall, Commr. R.N.R.	A. G. Barnett, H. R. Hamilton, G. P. Parkinson.	1	3	5	Australia, New Zealand, *viâ* Capes.
"Kincraig," S.S. ...	A. G. Reid	E. Bossaers, G. S. Patterson, P. S. Bailey ...	2	5	19	East Indies, South America, *viâ* Cape and Suez.
"King Idwal," S.S. ...	Brin L. Coats	Captain Coats	1	2	1	Karachi, *viâ* Suez.
"Kumara," S.S.	A. Morton ... / R. S. Lewis ...	A. C. Reid, K. J. Manners, Sub-Lieut. R.N.R., J. S. Fisher, H. S. Nicholas, J. F. Givison, H. Langburn.	3	8	14	Canada, Australia, New Zealand, *viâ* Capes, River Plate.
"Lake Michigan," S.S.	H. Parry	G. F. McCombie, Lieut. R.N.R., R. K. Watkins, J. Murphy.	1	3	7	Canada.
"Laurentic," S.S. ...	J. Mathias, Lieut. R.N.R.	A. S. Gilbert, Lieut. R.N.R., Geo. Davey, Sub-Lieut. R.N.R.	1	3	8	New York and Canada.
"Leander," S.S.	H. R. Ketley ... / J. H. Williams ...	J. H. Williams, L. Thompson	3	4	15	River Plate, Black Sea.
"Le Coq," S.S. ...	F. W. Peterson	A. S. Leech, A. H. Dean, F. G. Osbiston, J. A. Mein.	2	8	15	New York, Black Sea.
"Macedonia," S.S.	C. D. Bennett, Commr. R.N.R., R.D. / J. D. Andrews, Commr. R.N.R., R.D.	A. H. Ayres, Sub-Lieut. R.N.R., G. G. Randall, E. P. Lyndon, Sub-Lieut. R.N.R., F. M. Roxby, C. G. Byron, Sub-Lieut. R.N.R., G. E. Butler, M. W. Dowling, A. A. Gunnery.	4	11	9	Australia, New Zealand, *viâ* Suez.

METEOROLOGICAL REGISTERS received during the Year 1911-12—*continued.*

(3.)—*From the* MERCANTILE MARINE.—*Meteorological Logs*—continued.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
				Mths. Days.	
"Magdalena," S.S. ...	W. H. B. Trigge, Lieut. R.N.R.	... ...	1	1 12	West Indies, New York.
"Malta," S.S. ...	G. M. Montford, Commr. R.N.R., R.D.	R. J. Smith, H. L. Quick, Sub-Lieut. R.N.R., D. Stuart.	3	7 22	East Indies, China, Japan, *viâ* Suez.
"Manchester Commerce," S.S.	P. J. Heath ... / W. P. Couch ...	W. Henderson, G. Earlam, C. Bird	1	3 12	U.S.A. and Canada.
"Manchester Exchange," S.S.	T. A. Adamson	R. Smith. W. Date, D. Ramsdale, H. Williams.	2	5 29	U.S.A. and Canada.
"Manica," S.S. ...	F. O. Potts	... ...	1	5 12	Australia, Calcutta, *viâ* Cape and Suez.
"Manistee," S.S. ...	E. J. S. West	F. McColm, J. E. Sandham	2	7 9	Central America.
"Marathon," S.S. ...	P. J. Collins	H. C. Allingham, Sub-Lieut. R.N.R., E. J. Legge, W. R. Rutt.	3	8 7	Australia, *viâ* C.G.H.
"Marere," S.S. ...	T. B. Linklater ...	F. A. Renaut, R. S. Burham, H. E. Higgs, F. G. Williams, N. S. Marks, R. J. Harding.	2	5 27	Australia, New Zealand, *viâ* Capes.
"Mascotte," Barque...	G. B. Serra	... ...	1	5 24	River Plate and West Indies.
"Matatua," S.S. ...	L. B. Gillman	J. J. Allsopp, L. D. McKirdy. Sub-Lieut. R.N.R., W. C. Sussams, F. W. Edwards, H. M. Thompson.	2	6 14	New Zealand, *viâ* Cape.
"Matina," S.S.	F. H. Swain ... / A. D. Riseley ...	P. H. Tallack, Sub-Lieut. R.N.R., R. C. Warren, J. E. Walker, G. E. Ryan, H. Steidelman.	3	9 23	Gulf of Mexico.
"Miami," S.S. ...	A. E. Johnson	W. B. Davis, O. Pitts, W. B. Woodward ...	2	6 15	Central America.
"Minia," S.S. ...	W. G. S. De Carteret ...	J. Adams, P. D. Bates, J. N. Tinniswoode, E. E. Burt.	3	13 12	Cable work, North Atlantic.
"Monarch," H.M.T.S.	J. Wrake	W. Blyth, S. G. Gorton, E. Firmin	1	3 29	Cable work, Coasts of U.K.
"Monkstone," S.S. ...	S. W. Decent	W. Williams, N. Nash...	1	5 21	Black Sea. South America.

"Montrose," S.S. ...	H. G. Kendall, Lieut. R.N.R.	G. Robinson-Hudson, Lieut. R.N.R., R.D., W. Russell, J. Mackenzie, J. Chambers.	2	3 18	Canada and Bermuda.
"Mooltan," S.S. ...	R. L. Haddock, Commr. R.N.R.	E. H. Orchard, Lieut. R.N.R., F. E. French, Sub-Lieut. R.N.R., R. J. Hamlin, Sub-Lieut. R.N.R., R. C. Warden, Lieut. R.N.R., J. M. M. Tickell, E. A. J. W. Carter, Sub-Lieut. R.N.R.	3	8 16	Australia, New Zealand, *viâ* Suez.
"Morning," S.S. ...	W. Adams	... ...	1	6 9	Davis Strait and Baffin's Bay (Whaling).
"Narrung," S.S. ...	G. A. Millington ...	G. F. Ward, T. C. Bayard, L. V. Harvey, W. G. Dean, W. C. Postle, Sub-Lieut. R.N.R., D. N. Hulton, T. M. Goddard, Mid. R.N.R., T. Raine.	2	7 13	Australia, *viâ* Cape.
"Nicoya," S.S.	S. H. Simmons ... / E. W. Castle ...	F. G. Downes, E. W. A. Kelsall, H. S. Daniel, Mid. R.N.R., G. Gower-Castell, A. B. Hardy.	3	11 7	Gulf of Mexico.
"Niwaru," S.S.	J. E. L. Compton / P. E. Mello ...	G. A. H. Wilson, Mid. R.N.R.	2	6 6	New Zealand, Australia, *viâ* Capes and Suez.
"Nonsuch," S.S. ...	J. Goulding	H. Cooper, — Howes, N. Oswald ...	2	5 24	Japan, Ocean Island, *viâ* Suez.
"Nubia," S.S. ...	Francis J. Fox	H. Williams	2	5 12	China, Japan, East Indies, *viâ* Suez.
"Olympia," S.S.	G. Mitchell ... / R. H. Browne, Lieut. R.N.R.	G. S. Salmon, D. Macdonald, N. Doig, J. Stewart.	2	6 1	Bombay, *viâ* Suez.
"Omrah," S.S. ...	P. N. Layton, Lieut. R.N.R., R.D.	H. G. Thomson, Lieut. R.N.R., R. M. Ward, Lieut. R.N.R., T. H. Wilson, V. Symons, H. C. Groom, H. Phillips, Lieut. R.N.R., R. L. Dearden, Sub-Lieut. R.N.R.	3	6 12	Australia, *viâ* Suez.
"Opawa," S.S. ...	J. J. Cameron, Lieut. R.N.R.	F. J. Gaulton	1	3 10	New Zealand, *viâ* Capes.
"Ophir," S.S. ...	W. de M. Baynham, Lieut. R.N.R.	R. W. I. Marshall, Sub-Lieut. R.N.R., F. O'Sullivan, Sub-Lieut. R.N.R., R. L. Dearden, Sub-Lieut. R.N.R., S. J. Cunningham, Sub-Lieut. R.N.R.	1	2 9	Australia, *viâ* Suez.
"Orama," S.S. ...	A. J. Coad, Commr. R.N.R.	F. Holmes	1	2 5	Australia, *viâ* Suez.

METEOROLOGICAL REGISTERS received during the Year 1911–12—*continued.*

(3.)—*From the* MERCANTILE MARINE.—*Meteorological Logs*—continued.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations. Mths.	Days.	Voyage.
"Orari," S.S. ...	J. P. Forsdick ... E. T. Smith, Lieut. R.N.R.	A. E. Rivers, H. E. Martin, — Wood, W. T. Point.	2	5	12	New Zealand, *vid* Capes and Suez.
"Ormuz," S.S. ...	W. T. Cox, Lieut. R.N.R.	H. D. Groom, H. Phillips, Lieut. R.N.R., W. C. Weston, I. J. Hayes, Lieut. R.N.R., A. W. Bigsworth, Sub-Lieut. R.N.R.	2	4	26	Australia, *vid* Suez.
"Orontes," S.S.	J. F. H. Healey, Commr. R.N.R., R.D. W. de M. Baynham, Lieut. R.N.R.	A. H. Fraser, Lieut. R.N.R., G. L. Simner, Lieut. R.N.R., H. Phillips, Lieut. R.N.R., G. H. Harding, R. C. Glazebrook, Lieut. R.N.R., I. J. Hayes, Lieut. R.N.R., R. L. F. Hubbard, Sub-Lieut. R.N.R., H. S. Gillett, Sub-Lieut. R.N.R.	4	8	4	Australia, *vid* Suez.
"Orsova," S.S.	D. R. W. Parsons, Lieut. R.N.R. H. G. Staunton, Lieut. R.N.R.	H. S. Seale, G. R. Renshaw, Lieut. R.N.R., I. Norman Jones, W. Gordon Bennett, Sub-Lieut. R.N.R., W. C. Weston, H. G. Adams, A. Edgar, Sub-Lieut. R.N.R., C. J. P. Hill, Sub-Lieut. R.N.R., J. Jackson, W. S. Jackson, Sub-Lieut. R.N.R.	3	7	0	Australia, *vid* Suez.
"Orvieto," S.S. ...	W. S Shelford, Lieut. R.N.R.	A. L. Owens, Sub-Lieut. R.N.R., M. J. Sarson, W. Harrison, Lieut. R.N.R., G. G. Thorne, Sub-Lieut. R.N.R., W. G. Henderson, P. D. Crowther, C. G. Matheson, Lieut. R.N.R., A. Pryke.	3	7	4	Australia, *vid* Suez.
"Osterley," S.S.	W. J. Jenks, Lieut. R.N.R. D. R. W. Parsons, Lieut. R.N.R.	F. Holmes, R. B. Thomson, Lieut. R.N.R., W. H. Dowman, C. J. R. Webb, Lieut. R.N.R.	3	7	5	Australia, *vid* Suez.

"Otranto," S.S.	A. J. Coad, Commr. R.N.R. W. J. Jenks. Lieut. R.N.R.	E. E. Smith, Sub-Lieut. R.N.R., A. Pryke ...	2	5 5	Australia, *viâ* Suez.
"Otway," S.S. ...	F. S. Symons	C. A. Bullock, Lieut. R.N.R., C. F. Halliday, Lieut. R.N.R., J. C. Collie, Sub-Lieut. R.N.R., J. C. Wilson, Sub-Lieut. R.N.R., R. B. Maycock, Sub-Lieut. R.N.R., G. H. Wylie.	3	7 1	Australia, *viâ* Suez.
"Ovid," S.S.	L. Cubitt	W. E. Thomas, G. S. Kennedy	2	5 19	U.S.A., Rangoon, Karachi, *viâ* Suez.
"Pacuare," S.S.	J. H. H. Scudamore, Lieut. R.N.R. W. T. Forrester...	R. B. Drake, R. A. Thorburn, Sub-Lieut. R.N.R., B. Hope, D. McInnes, P. R. St. John.	3	9 19	Gulf of Mexico.
"Palma," S.S. ...	H. W. A. Clark, Commr. R.N.R.	F. Sudell. Lieut. R.N.R., — Corbyn, — Gray, B. Worthington, G. Steele, S. Chapman, J. Elliott.	2	6 24	Japan and Australia, *viâ* Suez.
"Peerless," S.S. ...	J. Williams	C. Vickers	1	2 12	Buenos Aires.
"Pembrokeshire," S.S.	R. Hayes ... W. C. Barrett ...	G. T. Walker, B. J. Davies, A. E. Gudgeon, B. K. Berry, Mid. R.N.R., J. G. B. Harrison, P. R. Burnham.	3	11 17	Japan, Vladivostok, *viâ* Suez.
"Persic," S.S.	W. F. Morgan, Lieut. R.N.R. A. H. Summers ...	T. Jones	2	3 29	Australia, *viâ* Cape.
"Politician" S.S. ...	G. B. Woolfenden ...	R. Watson, J. Crowley, J. Kennedy, E. Hocking.	3	6 6	Calcutta, *viâ* Suez.
"Port Jackson," Barque	C. Maitland	A. N. Mackay, N. Bateson, R. C. Watson ...	1	6 11	Australia, *viâ* Capes.
"Potosi," S.S. ...	A. T. D. Pearson, A.I.N.A.	— Galloway, — Jones, — Lawson, — Stowe	2	10 16	W.C. South America, *viâ* Magellan.
"Ramsay," S.S. ...	F. C. Mullan, F.R.G.S....	R. Bailey, J. L. Durkee, A. S. Thomas, A. C. Knight, R. S. Tozer.	2	9 16	Singapore, Bassein, *viâ* Suez, U.S.A., W.C.S.A.
"Reventazon," S.S.	J. G. Parsons ... J. Clarke ...	W. J. Geh, T. A. Thwaite, E. H. Brice ...	3	10 12	Gulf of Mexico.
"Rewa," S.S.	T. Kerr, Lieut. R.N.R.	F. G. Bright, P. H. Beaching, J. C. Henderson.	1	3 24	Karachi, *viâ* Suez.
"Rimutaka," S.S.	E. T. Smith, Lieut. R.N.R. ... F. A. Hemming	D. Gordon-Stables, A. B. McKinstry, H. R. Hamilton, C. H. Furlong, R. Hughes, H. Harold Bate, J. Twyman.	2	5 26	New Zealand, *viâ* Capes.

METEOROLOGICAL REGISTERS received during the Year 1911–12—*continued.*

(3.)—*From the* MERCANTILE MARINE.—*Meteorological Logs*—continued.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
				Mths. Days.	
S.S. ...	G. R. Metcalfe, Lieut. R.N.R.	A. Freeman, E. W. R. Avery	3	10 26	Australia, *viâ* C.G.H.
ince," S.S.	W. S. Jameson	R. Milliken, J. Smith, F. Marshall	2	5 17	East Coast, N. and S. America.
S. ...	T. Robertson	... ...	1	4 2	Greenland, Whaling.
Ship ...	J. Davies	... ...	1	9 22	Tacoma, *viâ* Cape Horn.
" S.S. ...	W. H. Knox	C. C. Lee, J. E. Martin, W. M. Henderson, W. L. Charlton.	2	4 27	Calcutta, *viâ* Suez.
re," S.S. ...	L. F. Taylor, Lieut. R.N.R.	J. Martin, J. Simpson	2	4 12	U.S.A., Mediterranean.
s," S.S. ...	C. E. Starok, Lieut. R.N.R.	H. P. Grindrod, Sub-Lieut. R.N.R., G. N. Jones, — Flett.	3	7 16	Australia, *viâ* Cape.
lk," S.S. ...	P. Davies	F. Blacker, R. Gard, F. Whiteley, J. Watkins.	2	5 1	Australia, *viâ* Cape and Suez.
"Thames," S.S.	G. S. Gillard, Lieut. R.N.R. W. G. Mason ... C. E. Down ...	F. Newton, A. H. Dobree, H. Lennox Taylor.	2	6 12	Buenos Aires, West Indies, and New York.
"Tongariro," S.S. ...	V. C. White Parsons ...	P. G. Hyde, P. J. Ballard, J. G. Holmes, F. M. Stephenson.	2	6 13	New Zealand, *viâ* Capes.
"Tortuguero," S.S. ...	J. G. Parsons	R. B. Drake, J. W. Gallop, R. Hobson, J. H. Parsons.	2	6 10	Central America.
"Ultonia," S.S ...	G. W. Melsom, Lieut. R.N.R.	E. Edkin, Lieut. R.N.R, F. C. Howard, Lieut. R.N.R.	1	2 2	New York, Mediterranean.
"Waipara," S.S. ...	J. S. Hutchison, Commr. R.N.R., R.D.	S. N. Rowe, L. Broadbent, A. W. Webster, W. W. Wilson, J. A. Wright, A. E. Harvey.	2	6 20	Australia, *viâ* Suez.
"Wakool," S.S. ...	W. G. Lingham, F.R.A.S., F.R.Met.Soc.	R. H. Ashby, H. E. Carson, T. Neilson, C. Harvey, H. F. Kent.	2	8 25	Australia, *viâ* Cape.
"Wanderer," S.S.	H. C. T. Melling R. Pugh	J. T. Baker, E. Jones	1	3 12	Gulf of Mexico.

"Wandsworth," S.S....	W. H. Bloomfield ...	W. J. Hall, G. Sinclair	1	4 17	East Coast, South America, Gulf of Mexico.
"Waverley," S.S. ...	H. R. Wheatley ...	R. Robertson, P. Henderson, W. J. Baker, J. Walls.	2	7 4	Black Sea, U.S.A., E.C.S.A.
"Whakarua," S.S. ...	J. Firth	J. C. Clayton, C. H. Purkis, L. H. Swan, Sub-Lieut. R.N.R.	1	2 24	New Zealand, *viâ* Capes.
"Whakatane," S.S. ...	F. A. Hemming ...	R. R. Neale, J. Makepeace, C. H. Furlong, M. W. Rosse.	1	3 22	St. John, N.B., Australia, *viâ* Capes.
"Wilcannia," S.S. ...	F. W. A. Hanson, Lieut. R.N.R.	J. S. Sheepwash, D. E Hotchkins, F. Berry, A. Grove, Lieut. R.N.R., F. N. Wyatt.	3	11 3	Australia, *viâ* Cape.
"Winkfield," S.S. ...	P. J. Greenhill	F. Carter	1	6 9	Buenos Aires, Calcutta, W.C.S.A., Gulf of Mexico, *viâ* Cape and Magellan.
"York Castle," S.S. ...	E. Mais	W. Williams, G. R. Parker, G. W. Beckh, W. Pace.	2	6 28	New York, Mauritius, Bombay, *viâ* Cape and Suez.
"Zent," S.S.	J. H. H. Scudamore. Lieut. R.N.R.	W. G. Preece, F. H. Gale, E. T. Grayston, R. H. Smith, P. H. Tallack, Sub-Lieut. R.N.R.	2	6 9	Port Limon.

(4.)—Abbreviated Meteorological Registers.

(a.) *From the Royal Navy* (—).

(b.) *From the Mercantile Marine* (1).

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
				Mths. Days.	
"Tambora," S.S. ...	W. Bagchus	A. H. Brach	1	1 26	Java, *viâ* Suez.

METEOROLOGICAL REGISTERS received during the year 1911–12 —*continued.*

(5.)—NORTH ATLANTIC REGISTERS—FORM No. 121 (1,495).

INDIAN OCEAN REGISTERS—FORM No. 122 (276).

RADIOTELEGRAPHY REGISTERS—FORM No. 138 (726).

Ships from which Radiotelegraphy Registers have been received are shown by the symbol †.

Line.	Ship.	Captain and No. of Registers.
Allan	*Carthaginian	R. G. Bamber, 17.
	†Corinthian	A. Rennie, 18.
	†Corsican	E. Cook, 10.
	Grampian	J. Williams, 20.
	†Hesperian	W. S. Main, F.R.G.S., 44.
	Ionian	R. T. Eastaway, 19.
	*†Lake Erie ...	H. G. Kendall, Lieut. R.N.R. / F. Carey } 30.
	†Mongolian	A. J. Peters, 13.
	Numidian	J. Hall, 6.
	Pomeranian ...	J. Henderson / A. Braid / W. P. Hains } 18.
	†Pretorian	B. Henry, 4.
	†Sardinian ...	G. Hamilton / R. McKillop } 10.
	†Scotian	T. Moar, 20.
	†Sicilian	D. Tannock / W. P. Hains / A. J. Peters } 25.
	†Tunisian...	J. A. Fairfull, 17.
	†Victorian	E. Outram, 30.
	†Virginian	J. T. Gambell, 30.
American	Friesland	C. J. Rogers, 4.
	†Haverford ...	J. H. W. Thornton / J. Evans } 23.
	†Merion	J. B. Hill, 13.
	†New York	W. J. Roberts, 5.
	†Philadelphia	A. R. Mills, 3.
	†St. Louis	J. C. Jamison, 22.
	†St. Paul	W. J. Roberts / F. M. Passow } 18.
Anchor	Algeria	P. McLean, 12.
	†Caledonia ...	W. Baxter / F. H. Wadsworth } 17.
	†California	J. Blaikie, 34.
	†Cameronia	W. Baxter.
	†Columbia ...	F. H. Wadsworth / G. Mitchell / J. Black } 11.
	Elysia	W. Robertson / A. Haig } 12.
	†Furnessia ...	J. Black / A. Collie. } 14.
	Olympia... ...	G. Mitchell / R. H. Browne, Lieut. R.N.R. } 10.
	Scindia	W. Kelso, 16.
Atlantic Transport ...	Mackinaw	W. F. Pollard, Lieut. R.N.R., 2.
	Manhattan	W. Johnston, 11.
	Maryland	J. McMath, 4.
	†Mesaba	O. P. Clarke, 6.
	†Minneapolis	F. O. Hasker, 31.

* Chartered.

METEOROLOGICAL REGISTERS received during the year 1911-12 —*continued.*

Line.	Ship.	Captain and No. of Registers.
Atlantic Transport—*cont.*	†Minnehaha ..	T. F. Gates. / F. H. Claret, Lieut. R.N.R. } 30.
	Minnesota ...	F. W. Lazell / J. T. J. Wylie } 14.
	†Minnetonka	E. G. Cannons, 32.
	†Minnewaska ...	F. H. Claret, Lieut. R.N.R. / T. F. Gates } 29.
	Mobile	J. T. J. Wylie, 7.
	Montana	P. Laverock, 4.
Austin Friars S.S. Co.	Haileybury	G. H. Sheppard, 5.
Ribby	Gloucestershire ...	G. H. Harris, Lieut. R.N.R., 19.
Bolton S.S. Co. ...	Ramsay	F. C. Mullan, F.R.G.S., 1.
Booth	Anselm	A. W. Stoker, 4.
	Francis	R. G. Williamson, 3.
Bowring, C. T. & Co.	Gafsa	G. Boulter / E. E. Cooper } 4.
	Huelva	F. J. Tamlin, 2.
	Pola	H. Hughes, 1.
	Tafna	G. Boulter, 3.
British India Steam Navigation Co.	Chanda	J. C. Tice, 14.
	Colaba	J. Robertson, Lieut. R.N.R., 16.
	Culna	J. Farquharson, 12.
	Obra	H. A. G. Foster (3rd Officer), Observer.
	Pentakota	H. A. G. Foster (2nd Officer), Observer.
Brocklebank, T. & J.	Malakand	T. G. Legg, 8.
Bucknall Steamship Lines.	Kalomo	W. Keasley, 3.
	Katuna	A. Lee, 10.
	Koranna... ...	J. H. Beare / F. S. Gulston } 6.
Burrell & Son ...	Strathendrick	R. Crabb (Chief Officer) 5.
Butterfield and Swire	Ningpo	T. W. Pickard, 15.
Cairn	Cervona	C. T. Stooke, 10
	Devona	D. R. Murray, 11.
	Fremona... ...	J. Cunningham / D. Ritchie } 5.
	Hurona	D. Ritchie / W. Lindsay } 4.
	Jacona	O. Grund, 7.
Canadian Northern S.S. Co.	Royal Edward	W. Roberts, 12.
	Royal George	J. Harrison, 20.
Canadian-Pacific Railway Co.	†Empress of Britain ...	J. A. Murray, 23.
	†Empress of Ireland ...	J. V. Forster, Lieut. R.N.R., 40.
	†Lake Champlain ...	G. S. Webster, Lieut. R.N.R., 26.
	†Lake Manitoba... ...	G. C. Evans, 17.
	†Lake Michigan	H. Parry, 14.
	†Monmouth	J. Turnbull, Lieut. R.N.R., 9.
	†Montcalm	C. W. Hodder, 22.
	†Montezuma	E. Griffiths, Lieut. R.N.R., 20.
	†Montfort	W. M. Davidson, 16.
	†Montreal	R. H. McNeill, 23.
	†Montrose ...	H. G. Kendall, Lieut. R.N.R. / G. S. Webster, Lieut. R.N.R., R.D. } 10.
	†Mount Temple	J. H. Moore, 16.
Clan	Clan Macintosh ...	W. J. Lennox, 23.
Clyde Shipping Co. ...	Spithead...	E. C. Tuckwell, 8.
Corry, J. P., & Co. ...	Star of Canada	J. M. Hart, 5.
Cunard	†Albania	S. G. S. McNeill, Lieut. R.N.R.
	†Ascania	W. R. D. Irvine, R.D., Commr. R.N.R. / G. W. Melsom, Lieut. R.N.R. } 10.

METEOROLOGICAL REGISTERS received during the year 1911-12 —*continued.*

Line.	Ship.	Captain and No. of Registers.
Cunard—*cont.*	†Ausonia	E. G. Diggle, Lieut. R.N.R., 4.
	Brescia	C. Morison, 7.
	†Campania	R. C. Warr, 21.
	†Carmania ...	D. Dow, R.D., Commr. R.N.R. / W. T. Turner — 21.
	†Caronia	J. C. Barr, 15.
	Carpathia	D. S. Miller, Lieut. R.N.R., 11.
	Cypria	E. G. Diggle, Lieut. R.N.R. / T. W. Hankinson, Lieut. R.N.R. / W. H. Hossack, Lieut. R.N.R. — 8.
	†Franconia	C. A. Smith, R.D., Commr. R.N.R., 14.
	†Ivernia	T. Potter / W. R. D. Irvine, R.D., Commr. R.N.R. / H. M. Benison, Lieut. R.N.R. — 13.
	†Laconia	W. R. D. Irvine, R.D., Commr. R.N.R., 2.
	†Lusitania	J. T. W. Charles, C.B., R.D., Commr. R.N.R., 21.
	Lycia	T. W. Hankinson, Lieut. R.N.R. / J. F. Simpson — 10.
	†Mauretania	W. T. Turner, 10.
	Pannonia ...	A. H. Rostron, R.D., Commr. R.N.R. / R. Capper, Lieut. R.N.R. — 15.
	Phrygia	R. Capper, Lieut. R.N.R. / R. G. Malin, Lieut. R.N.R. — 5.
	†Saxonia	H. M. Benison, Lieut. R.N.R. / E. G. Diggle, Lieut. R.N.R. — 12.
	Tyria	W. B. Cresser, Lieut. R.N.R., 8.
	Veria	S. Jones / G. F. Jeffries — 10.
(Danish)	Dania	H. L. Pedersen, 10.
Dominion	†Canada	R. O. Jones, 21.
	†Dominion	W. L. Mendus, 3.
	Irishman	T. Howell, 1.
Elders & Fyffes ...	Barranca	S. H. Simmons, 12.
	Manistee	E. J. S. West, 10.
	Matina	F. H. Swain / A. D. Riseley — 16.
	Miami	A. E. Johnson, 12.
	Nicoya	E. W. Castle, 16.
	Pacuare	W. T. Forrester, 16.
	Tortuguero	J. G. Parsons, 16.
	Zent	J. H. H. Scudamore, Lieut. R.N.R., 12.
Elswick S.S. Co. ...	Elswick Grange ...	G. Wilson, 10.
Furness, Withy ...	Crown Point	J. C. Walker, 13.
	Potomac	P. B. Wamsley, 3.
Glenroy S.S. Co. ...	Glenroy	S. Freeman, 5.
Gulf Transport ...	Imani	S. C. Penberthy, W. J. Rosewarne — 12.
	Inkula	E. A. Alcide, 3.
	Inkum	W. E. Price, 4.
	Istrar	C. M. M. Jacob, 12.
H.M.S.	Terror	B. H. Fanshawe, Capt. R.N. / G. E. Corbett, Commr. R.N. — 27.
Harrison	Artist	E. T. Sawyer, 8.

METEOROLOGICAL REGISTERS received during the year 1911-12 —*continued.*

Line.	Ship.	Captain and No. of Registers.
Harrison—*cont.*	Custodian	D. G. Cownie, 1.
	Historian	H. H. Pyle, 12.
	Logician	F. E. Westhorp, 12.
	Merchant	C. S. Rhodes, 4.
	Orator	H. C. T. Melling, 1.
Henderson, P., & Co...	Amarapoora	J. Reid, 6.
	Martaban ...	W. J. Hamilton / W. Duguid } 12.
Hogarth S.S. Co. ...	Baron Minto	Thos. Baillie, 1.
(Italian)	Barque Silverstream ...	D. Garziano, 2.
Leyland, F.	Antillian	W. Japha, 9.
	Atlantian	A. H. Highton, 9.
	Barbadian	C. H. Manning, 7.
	Belgian	G. Williams, 5.
	Bohemian	N. MacCallum, 20.
	Caledonian	J. R. Carnon, Lieut. R.N.R., 2.
	Etonian	W. E. Wood, 5.
	Michigan	S. W. Watkins, 9.
	Oxonian	J. A. Baker / J. Robb. } 4.
Manchester Liners ...	Knutsford	A. Richardson, 3.
	Manchester Corporation	P. J. Heath, 7.
	Manchester Port ...	C. H. Stott, 4.
	Manchester Spinner ...	C. Payne, 2.
Mercantile S.S. Co. ...	Boyne	S. G. Dale, 11.
	Lena	H. J. Charters, 8.
Peninsular and Oriental.	Assaye	G. W. Cockman, R.D., Commr. R.N.R., 11.
	Banca	A. Collyer / H. W. Potter, R.D., Lieut. R.N.R. } 7.
	Caledonia ...	W. Hayward, Lieut. R.N.R. / B. W. Snow } 13.
	Delta	E. P. Martin, Lieut. R.N.R., 9.
	Egypt	D. Asbury / F. R. Summers } 18.
	Malta	G. M. Montford, R.D., Commr. R.N.R., 3.
	Mongolia ...	C. H. S. Tocque, Commr. R.N.R. / C. F. Preston, Commr. R.N.R. } 7.
	Persia	W. Hayward, Lieut. R.N.R. / W. H. Haughton, R.D., Commr. R.N.R. } 19.
	Salsetto	H. G. H. Lewellin, Lieut. R.N.R., 9.
Prince...	Ocean Prince	W. C. Barrett, 3.
	Saxon Prince	W. S. Jameson, 3.
	Welsh Prince ...	A. B. W. Sheppard, Lieut. R.N.R. / T. Hodson. } 10.
Pyman	Waverley	H. R. Wheatley, 9.
Red Star	†Finland	J. S. Ball / T. G. Barman } 23.
	†Kroonland	T. Bradshaw, 10.
	†Lapland	P. Breibohm / H. D. Doxrüd } 23.
	†Manitou	W. F. Pollard, Lieut. R.N.R. / F. W. Lazell / A. E. Tribe, Lieut. R.N.R. } 15.
	†Marquette ...	A. E. Tribe, Lieut. R.N.R. / J. B. Findlay } 6.

METEOROLOGICAL REGISTERS received during the year 1911–12 —*continued.*

Line.	Ship.	Captain and No. of Registers.
Red Star—*cont.*	†Menominee	S. Anfindsen, 11.
	†Samland	J. C. C. Moller, 2.
	†Vaderland ...	T. G. Barman, R. Prager } 48.
	†Zeeland	J. B. Kelk, J. C. C. Moller } 8.
Rickinson Bros. ...	Agenoria	W. Kirkwood, 4.
Rotterdam Lloyd ...	Goentoer	M. van der Putte, 16.
	Tambora...	W. Bagchus, 13.
Smith, Geo., & Sons	City of Athens	W. Knaut, 9.
	City of Benares ...	A. J. Elliott, 5.
Stoomvaart Maatschappij Nederland.	Karimoen	J. Alberts, 3.
	Konig Willem III. ...	J. Alberts, 1.
	Prinses Juliana ...	J. Teensma, 3.
	Vondel	J. R. de Brouwers, 4.
Thomson, W., & Co. ...	Benarty	J. D. Sarchet, 13.
	Bengloe	W. A. Guy, 8.
	Benvenue	R. Kroble, 8.
Trechmann S.S. Co.	Frieda	R. C. Hill, 5.
	Wilster	T. Martin, 3.
Union-Castle ...	Galeka	T. H. Wilford, 2.
	Galway Castle	T. H. Wilford, 1.
White Star	†Adriatic	B. F. Hayce, R.D., Commr. R.N.R., 28.
	Afric	J. Stivey, Lieut. R.N.R., 3.
	†Arabic	W. Finch, Lieut. R.N.R., 25.
	†Baltic	J. B. Ranson, Lieut. R.N.R., 15.
	Bovic	J. J. Kearney, Lieut. R.N.R., 5.
	Canopic	J. O. Carter, Commr. R.N.R., 15.
	†Cedric	C. A. Bartlett, R.D., Commr. R.N.R., H. Smith, Lieut. R.N.R. } 16.
	†Celtic	A. E. S. Hambelton, Lieut. R.N.R., 38.
	Cretic	J. B. Kelk, R. Lobez, Lieut. R.N.R. } 11.
	†Cymric	F. B. Howarth, Commr. R.N.R., 16.
	†Laurentic	J. Mathias, Lieut. R.N.R , 15.
	†Majestic	F. E. Beadnell, Lieut. R.N.R., 12.
	†Megantic ...	H. Smith, Lieut. R.N.R., H. F. David, R.D., Commr. R.N.R. } 22.
	†Oceanic	H. J. Haddock, C.B., R.D., Commr. R.N.R.. 15.
	†Olympic	E. J. Smith, R.D., Commr. R.N.R., 34.
	Romanic...	H. F. David, R.D., Commr. R.N.R., 11.

APPENDIX V.

Instruments supplied, &c., to the Mercantile Marine.

Particulars.	Barometers.	Thermometers.	Hydrometers.	Screens.
April 1st, 1911, afloat	192	1,020	629	178
Issued since	54	309	149	35
	246	1,329	778	213
Returned since	45	278	125	30
	201	1,051	653	183
Written off as lost, &c.	3	148	62	5
April 1st, 1912, afloat	198	903	591	178

Disposition of Mercantile Marine Instruments, April 1st, 1912.

Particulars.	Barometers.	Thermometers.	Hydrometers.	Screens.
In merchant ships	198	903	591	178
„ store at M.O.	3	2	40	1
At Liverpool Agency	3	23	9	3
„ Glasgow „	3	4	6	2
„ Dundee „	3	21	6	3
„ Hull „	1	12	6	4
„ Cardiff „	1	6	9	3
„ Southampton „	4	19	30	8
„ Sunderland „	5	23	18	7
Total, April 1st, 1912	221	1,013	715	209
Under repair, April 1st, 1912	11	14	13	—

Instruments at Stations, viz.: Telegraphic Reporting Stations, Observatories, Fishing Villages, &c.

(*a.*) Thermometers and Screens.

—	Thermometers.					Screens.
	Ordinary.	Maximum.	Minimum.	Solar.	Grass Minimum.	
April 1st, 1911, in use ...	393	80	73	11	13	122
Issued since	48	8	14	2	3	4
	446	88	87	13	16	126
Returned since	38	4	8	—	—	1
Written off	27	2	5	—	—	—
April 1st, 1912, in use ...	381	82	74	13	16	125

(*b.*) OTHER INSTRUMENTS.

	Barometers.	Aneroids and Barographs.	Sunshine Recorders.	Rain Gauges.	Anemometers.	Storm Signal Cones
April 1st, 1911, in use ...	320	39	36	101	30	225
Issued since	3	1	1	5	1	30
	323	40	37	106	31	255
Returned since	7	3	—	2	1	—
Written off	—	—	—	—	—	30
April 1st, 1912, in use ...	*316	37	37	104	30	225

* 224 barometers (mercurial) and 1 barograph are lent for the use of seafaring communities at fishing villages and ports.

STOCK ACCOUNT of INSTRUMENTS received and issued on repayment to the Crown Agents for the Colonies, Colonial Governments, and other Observers, from 1st April, 1911, to 31st March, 1912.

	Thermometers.					Thermograph.	Stevenson's Screens.	Tropical Screens.
	Ordinary.	Maximum.	Minimum.	Solar.	Grass Min.			
Stock, April 1st, 1911	119	23	13	5	7	1	6	6
Received since ...	312	64	58	42	49	29	12	6
	431	87	71	47	56	30	18	12
Issued since ...	252	68	60	40	56	29	15	8
Stock, April 1st, 1912	179	19	11	7	—	1	3	4

	Barometers.		Raingauges.	8 inch glasses.	5 inch glasses.	Sunshine Frames.	Sunshine Ball-.	Cones.	Hygrographs.
	Mercurial.	Graphs.							
Stock, April 1st, 1911	10	—	13	12	11	4	5	12	1
Received since ...	29	14	328	49	360	8	6	36	14
	39	14	341	61	371	12	11	48	15
Issued since ...	35	13	321	51	352	9	8	31	2
Stock, April 1st, 1912	4	1	20	10	19	3	3	17	13

In addition, the following miscellaneous instruments were received and issued during the period :—

3 Besson Nephoscopes.
6 5-inch Aneroids.
3 Clinometer Compasses.
12 Sprung-Fuess Pens.
1 Astronomical Clock.
8 Surveying Theodolites.
3 Special Earth Thermometers.
1 Wind Vane.
5 Recording Raingauges.
2 Lander Anemometers.
1 Spectroscope.
1 Assmann Aspiration Pyschometer.
1 Anemo-Biagraph.
1 "Peander" Anemometer.
3 Hyetographs.
1 Recording Psychrometer.
300 Sheets Bromide Paper.
1 Casella Rainfall Recorder.

APPENDIX VI.

Report on the Inspection of Stations in connexion with the Office in 1911.

The inspectors were as follows :—

Districts 0, 1 and 6	Mr. A. Watt, Mr. R. G. K Lempfert.
District 2	Mr. R. H. Curtis.
„ 3	Mr. R. H. Curtis.
„ 4	Mr. F. J. Brodie.
„ 5	Mr. R. Corless.
„ 7	Mr. A. Watt, Mr. F. J. Brodie.
„ 8	Mr. E. Gold.
„ 9	Mr. H. Harries.
„ 10	Mr. E. G. Constable.
Observatories and Anemograph Stations.	Mr. R. H. Curtis, Mr. R. Corless, and Mr. E. G. Constable, Mr. E. Gold.

At the observatories and anemograph stations the instruments were dismounted and cleaned, and all necessary repairs were carried out. At those observatories which are also climatological or telegraphic reporting stations the arrangements for this work were examined.

The reports show that efficiency has been maintained on the whole; in a number of cases the inspectors were able to make suggestions for improving the observations by bringing them more into line with recognized conventions. Points requiring attention which could not be settled on the spot have been dealt with by correspondence.

The following is a list of the stations visited :—

Observatories.

Aberdeen.
Armagh.
Falmouth.
Glasgow.
Oxford.
Stonyhurst.
Valencia.

Additional Anemograph Stations.

Alnwick Castle.
Deerness.
Dover.
Dublin (Phœnix Park).
Fleetwood.
Gorleston.
Holyhead.
Kingstown.
Pendennis Castle (Falmouth).
Plymouth.
Quilty.
Roche's Point.
Scilly.
Shoeburyness.
Yarmouth.

Normal Climatological Stations.

Armagh.
Bettws-y-coed.
Darwen.
Deerness.
Dublin (Phœnix Park).
Eastbourne.

NORMAL CLIMATOLOGICAL STATIONS—*continued.*

Fort William.
Fort Augustus.
Glasgow.
Gordon Castle.
Hull.
Kingussie.
Manchester (City).
Manchester (Prestwich).
Manchester (Whitworth Park).
Newton Rigg.
Plymouth.
Rugby.
St. Leonards.
Sheffield.
Stonyhurst.
Strathpeffer Spa.
Wistaustow.
Woburn.

AUXILIARY CLIMATOLOGICAL STATIONS.

Alnwick Castle.
Balmoral.
Baltasound.
Bexhill-on-Sea.
Bournemouth.
Bromyard.
Bucklebury Place.
Burnley.
Carnforth.
Carnoustie.
Chopwellwood.
Cirencester.
Crathes.
Dunfanaghy.
Folkestone.
Hawarden Bridge.
Insch.
Kilmarnock.
Kingston-on-Soar.
Kingstown.
Margate.
Marlborough.
Oban.
Rhyl.
Sevenoaks.
Shoeburyness.
Stonehaven.
Thorntonhall.
Ventnor.
Waterford.
West Linton.
Weymouth.
Worthing.
Wymondham.

TELEGRAPHIC REPORTING STATIONS.

Aberdeen.
Bath.
Birr Castle.
Blacksod Point.
Castlebay.
Clacton-on-Sea.
Donaghadee.
Dover.
Dungeness.
Holyhead.
Leith.
Lerwick.
Malin Head.
Nairn.
Newquay.
North Shields.
Nottingham.
Oxford.
Portland Bill.
Roche's Point.
St. Ann's Head.
Scilly.
Spurn Head.
Stornoway.
Valencia.
Wick.
Yarmouth.

Mr. W. Marriott visited the following stations which are in connexion with the Royal Meteorological Society, as well as with the Office :—

Blackpool, Buxton, Cheadle, Harrogate, Hillingdon, Worksop (Hodsock), Lancaster, Lowestoft, Norwich, Raunds, Rounton, Scarborough, Southport, Wakefield.

APPENDIX VII.

Geographical List of Institutions and Persons from whom Publications containing Meteorological Data have been received during the last Nine Years.

The list is arranged in accordance with the revised topographical classification adopted in the International Catalogue of Scientific Literature. *In each section the names of institutions which collect observations from a network of stations, or which publish observations on an extended scale, have been placed first.* In a number of instances, particularly in the case of tropical countries, observations are published by authorities not domiciled in the country. In these instances the names of the places of observation have been given as far as space permits, and the names of the institutions issuing the publications have been printed in *italic* type. If no names of places are quoted, it may be assumed that returns from a number of stations are given.

The character of the information available has been indicated by quoting the numbers in the International Catalogue under which the publications have been classified.

The year quoted is the last complete year for which the information has been received.

The classification numbers employed are as follows :—

1710 and 1730. Climatology—Agricultural and Hygienic.
1180. Rainfall Tables.
1800. Meteorological Observations—General.
1810. Hourly Values.
1820. Daily Values.
1825. Monthly and Yearly Mean Values.
1830. Daily Weather Reports.
1840. Weather Reports—Weekly, Monthly, &c.

† Indicates publications which give information for the upper air, obtained with balloons or kites.

Geographical List of Institutions and Persons supplying published Meteorological Data.

Name of Institution, &c.	Climatology—Agricultural and Hygienic. 1710 & 1730	Rainfall Tables. 1180.	Meteorological Observations—General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values. 1825.	Daily Weather Reports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
GENERAL.								
International Committee for Scientific Aeronautics, Strassburg.	—	—	1908	—	—	—	—	—
Board of Trade, London—Commercial, Labour, and Statistical Department.	—	—	—	—	—	1907	—	—
Symons's Meteorological Magazine ..	—	—	—	—	—	1911	—	—
d. **EUROPE AND MEDITERRANEAN SEA AND ISLANDS.**								
Deutsche Seewarte, Hamburg	—	—	—	—	—	—	—	1910
da. **Scandinavia: Sweden, Norway, Denmark, Iceland, Faeroes:—**								
Dansk Meteorologisk Institut (Copenhagen).	—	—	1908	—	1911	1908	1911	1911
Norsk Meteorologisk Institut (Christiania).	—	1910	1910	1910	1910	1910	—	—
Svensk Meteorologisk Institut (Stockholm).	—	—	—	—	—	—	—	1911
K. Svenska Vetenskaps-Akademie (Stockholm).	—	1910	1910	—	1910	1910	—	—
Hydrografiska Byrån (Stockholm)	—	1909	—	—	—	—	—	—
Stockholm (H. E. Hamberg) ..	—	—	—	—	—	*	—	—
Upsala, Observatoire Météorologique de l'Université.	—	—	1911	1911	1911	—	—	—
Vassijaure, *K. Svenska Ventensks. Akademie, Stockholm.*	—	—	—	1907	—	—	—	—
db. **Russia in Europe:—**								
Observatoire Physique Central Nicolas (St. Petersburg).	—	—	1907	1907	1907	1907	1911†	1911
Finland, Meteorologische Zentralanstalt (Helsingfors).	—	—	1906	1906	1906	1906	—	1907
Kaiserliche Livländische Gemeinnützige u. Ökonomische Sozietät. Dorpat (Jurjef).	—	1905	—	—	—	—	—	—
Dorpat, Meteorologisches Observatorium.	—	—	1910	1910	1910	—	—	—
Dorpat, Station Météorologique de l'École Reale.	—	—	—	—	1906	—	—	—
Kazan, Observatoire Météorologique.	—	—	—	—	1911	—	—	—
Kieff, Observatoire Météorologique.	—	—	—	1908	1908	—	—	—
Moscow (E. Leyst)	—	—	1909	—	—	—	—	—
Moscow, Meteorologisches Observatorium der K. Universität	—	—	1909	1909	1909	—	—	—
Nijni-Oltchedaeff, Observatoire Météorologique.	—	—	1911	1911	1911	1909	—	—
Odessa, Observatoire Météorologique et Magnétique de l'Université Impériale.	—	1905	1905	—	1910†	1906	—	—
St. Petersburg, Observatoire Météorologique de l'Institut Forestier Impériale.	—	—	—	—	1909	—	—	—
Tiflis, Physical Observatory ..	—	—	1904	1904	—	—	—	1909†
Warsaw, Station Centrale Météorologique du Musée de l'Industrie et de l'Agriculture.	—	—	1908	—	1908	1908	—	—

* Means of temperature in Stockholm for 1756 to 1905 and in Sweden for 1856 to 1907.

GEOGRAPHICAL LIST—*continued.*

NAME OF INSTITUTION, &c.	Climatology—Agricultural and Hygienic. 1710 & 1730.	Rainfall Tables. 1180.	Meteorological Observations—General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values. 1825.	Daily Weather Reports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
d.* EUROPE AND MEDITERRANEAN ISLANDS—*cont.								
***dc.* German Empire:—**								
Deutsche Seewarte (Hamburg)	—	—	1910	1910	1910	1910	1911†	1911
Prussia, K. Meteorologisches Institut (Berlin).	—	1909	1907	1907	1907	1911	—	1911
Alsace-Lorraine, Meteorologischer Landesdienst (Strassburg).	—	—	1905	1905	1905	1911	—	—
Baden, Central Bureau für Meteorologie und Hydrographie (Carlsruhe).	—	1911	1910	—	1910	1910	—	1911
Bavaria, K. Meteorologische Central Station (Munich).	—	—	1910†	1910	1910	1910	1911	—
Hessen, G. Hydrographisches Bureau (Darmstadt).	—	1910	1910	1910	1910	1910	—	1911
Saxony, K. Sächs. Landes-Wetterwarte (Dresden).	—	—	1907	1907	1907	1907	1911	1909
Württemberg, K. Statistisches Landesamt und Meteorologische Central Station (Stuttgart).	—	—	1910	1900	1910	1910	—	1911
Aachen, Meteorologisches Observatorium.	—	—	1909	1909	1909	1909	1911	—
Berlin, Wetter Bureau	—	—	—	—	—	—	1911	—
Bremen, Meteorologische Station	—	—	1910	1910	1910	1910	—	—
Eberswalde, Meteorologische Station.	—	—	—	—	—	—	—	1903
Emden, Naturforschende Gesellschaft.	—	—	—	—	—	1907	—	—
Frankfurt am Main, Physikalischer Verein.	—	—	—	—	1908	—	1911	—
Lindenberg, K. Preussisches Aeronautisches Observatorium.	—	—	1908†	—	—	—	—	—
Potsdam, K. Preuss. Met. Institut	—	—	1910	1910	1910	—	—	—
***dd.* Holland; Belgium; Luxemburg:—**								
K. Nederlandsch Meteorologisch Institut (de Bilt).	—	1909	1909	1909	1909	1909	1911	1911
Observatoire Royal, Uccle, Brussels.	—	—	1904	1904	1904	1904	1911	—
Mons (A. Bracke)	—	—	—	—	1905	—	—	—
***de.* British Islands:—**								
Meteorological Office (London)	—	—	—	1911	1911	1911	1911	1911†
British Rainfall (H. R. Mill) ..	—	1910	—	—	—	—	—	—
R. Meteorological Society (London).	—	—	1910	—	1910	1910	—	—
Scottish Meteorological Society (Edinburgh).	—	1910	1910	—	—	1910	—	—
Board of Agriculture and Fisheries, London.	1910	—	—	—	—	—	—	—
General Register Office, Dublin	1911	—	—	—	1911	1911	—	1911
General Register Office, London	1911	—	—	—	1911	1911	—	1911
Registrar General's Office, Edinburgh.	1911	—	—	—	—	1911	—	1911
Royal Observatory, Greenwich	—	—	1909	1909	1909	—	—	—
Royal Society of Edinburgh [Fort William and Ben Nevis].	—	—	—	1897	—	—	—	—
Bath, Medical Officer of Health	1910	—	—	—	—	1910	—	—
Birmingham Scientific Society..	—	—	1910	—	1910	—	—	—
Blackpool, Public Health Office	1910	—	—	—	—	1910	—	—
Bognor, Medical Officer of Health	1909	—	—	—	—	1908	—	—
Bolton, The Museums and Meteorological Observatory.	—	—	—	—	—	1911	—	1911

GEOGRAPHICAL LIST—*continued.*

	NAME OF INSTITUTION, &c.	Climatology—Agricultural and Hygienic. 1710 & 1730.	Rainfall Tables. 1180.	Meteorological Observations—General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values. 1825.	Daily Weather Reports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
d	**EUROPE AND MEDITERRANEAN ISLANDS**—*cont.*								
de.	**British Islands**—*cont.*								
	Borden Wood, Sussex (E. Lamb)	—	—	—	—	—	1911	—	—
	Bournemouth (C. Dales)	—	—	—	—	—	1907	—	—
	Brighton, Medical Officer of Health.	1902	—	—	—	—	—	—	—
	Burnley, Medical Officer of Health.	1910	—	1910	—	—	—	—	—
	Buxton, Devonshire Hospital ..	—	—	—	—	—	1910	—	—
	Canterbury (A. Lander)	—	—	—	—	—	1909	—	—
	Cardiff, Naturalists' Society ..	—	1907	—	—	—	1907	—	—
	Cardiff, Waterworks Engineer's Office.	—	1905	—	—	—	—	—	—
	Chester (J. C. Mitchell)	—	—	—	—	—	1905	—	—
	Clongowes Wood College ..	—	—	—	—	—	1910	—	—
	Cockle Park, Morpeth	—	—	—	—	—	1904	—	—
	Coventry, Medical Officer of Health.	1910	—	—	—	—	1910	—	—
	Croydon, Natural History and Scientific Society.	—	1910	—	—	1910	—	—	—
	Devon, North (T. Wainwright)..	—	—	—	—	—	1911	—	—
	Dorset (H. Stilwell)	—	1910	—	—	—	—	—	—
	Eastbourne, Borough Meteorologist.	—	—	—	—	—	1910	—	—
	East Ham, Public Health Department.	1907	—	—	—	—	1909	—	—
	Falmouth, R. Cornwall Polytechnic Society.	—	—	—	—	—	1910	—	—
	Great Central Railway	—	1911	—	—	—	—	—	—
	Great Yarmouth, Urban Sanitary Authority.	1910	—	—	—	—	1910	—	—
	Hampstead Scientific Society ..	—	—	—	—	—	1910	—	—
	Harrogate, Harlow Moor Observatory.	—	—	—	—	—	1907	—	—
	Hastings, Borough Meteorologist.	—	—	—	—	—	1910	—	—
	Hertfordshire (J. Hopkinson) ..	—	1906	—	—	—	1906	—	—
	Hoylake and West Kirby, Urban District Council.	—	—	—	—	—	1910	—	—
	Isle of Man (*late* A. W. Moore) ..	—	—	—	—	—	1904	—	—
	Kew, National Physical Laboratory.	—	—	—	—	—	1910	—	—
	Kingston-on-Thames, Surrey County Council.	1908	—	—	—	—	1908	—	—
	Liverpool Observatory, Bidston.	—	—	—	—	1908	—	—	—
	London, Royal Botanic Society	—	—	—	—	1909	—	—	—
	Lowestoft, Medical Officer of Health.	1910	—	—	—	—	1910	—	—
	Manchester, Godlee Observatory	—	—	—	—	1909	—	—	—
	Manchester, Public Health Office	1904	—	—	—	1904	—	—	—
	Margate, Borough Meteorologist	1910	—	—	—	—	1910	—	—
	[Netley.] *Army Medical Department, London.*	—	—	—	—	—	1906	—	—
	Northampton, Natural History Society.	—	1910	—	—	—	—	—	1910
	Norwich (A. W. Preston) ..	—	—	—	—	—	1910	—	—
	Nottingham (A. Brown and P. Boobbyer).	—	1911	1911	—	—	—	—	—
	Nottingham, Rural District Council of Basford.	1903	—	—	—	—	1903	—	—
	Oxford, Radcliffe Observatory..	—	—	—	—	1905	—	—	—
	Paisley, Coats Observatory ..	—	—	—	—	—	1905	—	—
	Perth, Natural History Museum	—	—	—	—	—	1911	—	—
	Portsmouth, Medical Officer of Health.	1909	—	1909	—	—	—	—	—
	Rousdon Observatory	—	—	—	—	—	1903	—	—
	Rugby School Natural History Society.	—	—	—	—	—	1910	—	—
	Scarborough, Medical Officer of Health.	1909	—	—	—	—	1909	—	—
	Seaham Harbour, Medical Officer of Health.	1907	—	—	—	—	1907	—	—

GEOGRAPHICAL LIST—*continued.*

NAME OF INSTITUTION, &c.	Climatology—Agricultural and Hygienic. 1710 & 1730.	Rainfall Tables. 1180.	Meteorological Observations—General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values. 1825.	Daily Weather Reports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
d.* EUROPE AND MEDITERRANEAN ISLANDS—*cont.								
de.* British Islands—*cont.								
Sevenoaks (W. W. Wagstaffe) ..	—	—	—	—	—	1905	—	—
Shropshire (W. M. D. La Touche)	—	1910	—	—	—	—	—	—
Southampton, Medical Officer of Health.	1906	—	—	—	—	1906	—	—
Southport, Fernley Observatory	—	—	1910	1910	1911	1910	—	—
Stonyhurst College Observatory	—	—	—	—	—	1911	—	—
Teignmouth, Urban District Council.	—	1909	—	—	—	1911	—	—
Throcking (C. W. Harvey) ..	—	1909	—	—	—	1909	—	—
Totland Bay, Isle of Wight (J Dover).	—	—	—	—	—	1910	—	—
Truro, Cornwall County Council, Sanitary Committee.	1911	—	—	—	—	1910	—	1911
Truro (G. Penrose)	—	—	—	—	—	1900	—	—
Waterford (C. E. Perceval Bolton)	—	—	—	—	—	—	—	1911
Weymouth and Melcombe Regis	—	—	—	—	—	1909	—	—
Whitchurch (E. E. Glyde) ..	—	—	1910	—	—	—	—	—
Worksop (H. Mellish)	—	—	—	—	—	1911	—	—
York, Yorkshire Philosophical Society.	—	—	—	—	—	1910	—	—
***df.* France and Corsica:—**								
Bureau Central Météorologique de France (Paris).	—	1908	1908	1908	1908	1908	1911	1911
Avignon, Commission Météorologique du Département de Vaucluse.	—	—	1903	—	—	1903	—	—
Beaulieu, Sèvres et Vacquey (G. Eiffel).	—	—	1910	—	1905	1910	—	—
Bordeaux, Commission Météorologique de la Gironde.	—	1909	—	—	1909	—	—	—
Chevreuse, Observatoire	—	—	—	—	1907	—	—	—
Lyons, Commission Départementale de Météorologie du Rhône.	—	1908	1908	—	—	—	—	—
Marseilles, Commission de Météorologie du Département des Bouches-du-Rhone.	—	—	1910	—	1910	—	—	—
Paris, Observatoire Municipal (Observatoire de Montsouris).	—	—	—	—	1907	—	—	—
Paris, Service Hydrométrique du Bassin de la Seine.	—	1909	—	—	—	—	—	—
Perpignan, Commission Météorologique.	—	—	1908	—	1908	1908	—	—
Puy-de-Dôme, Observatoire ..	—	—	—	—	1905	—	—	—
***dg.* Iberian Peninsula (including Pyrenees): Spain (with Balearic Islands); Portugal:—**								
Instituto Central Meteorológico (Madrid).	—	—	—	—	—	1908	—	—
Observatorio Do Infante D. Luiz (Lisbon).	—	—	—	—	1910	1910	1911	—
Observatorio, Madrid	—	—	—	—	1910	1900	1911	—
Coimbra, Observatorio Meteorologico e Magnetico da Universidade.	—	—	1910	1910	1910	—	—	—
Gibraltar. *Army Medical Dep., London.*	—	—	—	—	—	1906	—	—
Gibraltar (Blue Book)	—	—	—	—	—	1911	—	—
Granada, Observatorio Meteorológico de Cartuja.	—	—	1910	1908	1911	—	—	—
Llinas, Observatorio Belloch ..	—	—	1904	—	—	—	—	—
Madrid, Chamartin de la Rosa, Observatorio Meteorológico.	—	—	—	—	1906	—	—	—
Malaga, Sociedad Malagveña de Ciencias.	—	—	—	—	—	1911	—	—

GEOGRAPHICAL LIST—*continued.*

NAME OF INSTITUTION, &C.	Climatology—Agricultural and Hygienic. 1710 & 1730.	Rainfall Tables. 1180.	Meteorological Observations—General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values 1825.	Daily Weather Reports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
d.* EUROPE AND MEDITERRANEAN ISLANDS—*cont.								
dg.* Iberian Peninsula—*cont.								
Mahon (Minorca). *Bureau Central Met., Paris.*	—	—	—	—	—	1908	—	—
Oña, Observatorio	—	—	—	—	1911	—	—	—
Oporto, Observatorio Meteorologico da Princeza D. Amelia.	—	—	—	—	—	1911	—	—
San Fernando, Instituto y Observatorio de Marina.	—	—	1909	1909	1909	—	—	—
Tortosa, Observatorio del Ebro..	—	—	—	—	1910	—	—	1910
***dh.* Italy: Sicily and Sardinia:—**								
Ufficio Centrale Meteorologico e Geodinamico Italiano (Rome).	1911	—	1908	—	—	1908	1911	—
Bologna, Osservatorio della R. Università.	—	—	—	—	1910	—	—	—
Catania, R. Osservatorio	—	—	—	—	—	1908	—	—
Florence, R. Museo di Fisica e Storia Naturale.	—	—	—	—	1909	—	—	—
Florence, Osservatorio Ximeniano	—	—	—	—	—	1907	—	—
Messina, Osservatorio	—	—	—	—	1907	—	—	—
Milan, R. Osservatorio Astronomico di Brera.	—	—	—	—	1910	—	—	—
Modena, R. Osservatorio Geofisico.	—	—	—	—	1908	—	—	—
Moncalieri, Osservatorio del Real Collegio Carlo Alberto.	—	—	—	—	1910	—	—	—
Naples, Instituto di Fisica Terrestre.	—	—	—	—	1910	—	—	—
Naples, R. Osservatorio di Capodimonte.	—	—	—	—	1909	1908	—	—
Riposto, Osservatorio Meteorologico del R. Instituto Nautico.	—	—	—	—	1911	—	—	—
Rome, Specola Vaticana	—	—	—	—	1905	—	—	—
Turin, Osservatorio della R. Università.	—	—	—	—	1910	—	—	—
Venice, Osservatorio Meteorologico del Seminario Patriarcale.	—	—	—	—	1908	—	—	—
Venice, Ufficio Idrografico ..	—	1910	—	1910	1910	—	—	—
***di.* Switzerland:—**								
Schweizerische Meteorologische Central Anstalt (Zürich).	—	1907	1910†	1910	1910	1910	1911	—
Berne, Abteilung für Landeshydrographie.	—	1909	1909	1904	1909	—	—	—
Davos Traffic Association ..	—	—	—	—	1911	—	—	1911
Genève et le Grand St. Bernard (R. Gautier).	—	—	—	—	1910	—	—	—
Lausanne, Institut Agricole ..	—	—	—	—	1908	—	—	—
St. Moritz (R. Gautier et H. Duaime).	—	—	—	—	1910	—	—	—
***dk.* Austria-Hungary, with Bosnia and Herzegovina:—**								
K. K. Central Anstalt für Meteorologie und Erdmagnetismus (Vienna).	—	—	1907	1907	1911†	1907	1911	1911
K. K. Hydrographischer Dienst in Osterreich (Vienna).	—	1908	—	—	1908	—	—	1911
Hydrographisches Amt der K. K. Kriegs-Marine (Pola).	—	—	1910	1910	1910	1906	—	—
K. Ung. Reichs-Anstalt für Meteor. und Erdmagn. (Budapest).	—	1907	1907	1907	1911	1907	1911	—
Bosnisch-Hercegovinische Landesregierung (Sarajevo).	—	—	1909	1909	1909	1909	—	—

GEOGRAPHICAL LIST—*continued.*

	NAME OF INSTITUTION, &C.	Climatology—Agricultural and Hygienic. 1710 & 1730.	Rainfall Tables. 1180.	Meteorological Observations—General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values. 1825.	Daily Weather Reports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
d.	**EUROPE AND MEDITERRANEAN ISLANDS**—*cont.*								
dk.	**Austria-Hungary, with Bosnia and Herzegovina**—*cont.*								
	Agram, Meteorologisches Observatorium.	—	1908	1904	1904	1904	—	—	—
	Brünn, Meteorologische Commission des naturforschenden Vereines.	—	—	1906	—	—	1906	—	—
	Cracow, C. K. Akademii Umiejętnosci u. Krakowie.	—	—	—	—	1902	—	—	—
	Cracow, K. K. Sternwarte ..	—	—	—	—	1911	—	—	—
	Cracow, Obserwatoryum ..	—	—	—	—	—	1910	—	—
	Fiume, K. K. Marine-Akademie	—	—	—	—	1906	—	—	—
	Innsbruck, Meteorologisches Observatorium.	—	—	1909	1909	1909	—	—	—
	Klagenfurt (F. Jäger)	—	—	—	—	1907	1907	—	—
	Kremsmünster, Sternwarte ..	—	—	1906	1906	—	—	—	—
	Prague, K. K. Sternwarte ..	—	—	—	—	1910	—	—	—
	Trieste, [I.R.] Osservatorio Astronomico-Meteorologico.	—	—	1907	1907	1907	1907	—	—
	Trieste, I.R. Osservatorio Marittimo.	—	—	—	—	—	—	1911	—
	Vienna, K. K. Sternwarte ..	—	—	—	—	1903	—	—	—
dl.	**Balkan Peninsula:—**								
	Observatorul Astronomic si Meteorologic (Bucharest).	1911	1911	1902	1902	1902	1902	1911	1910
	Observatoire National (Athens)	—	—	—	—	—	1908	—	—
	Belgrade, Observatoire Central	—	—	—	1903	—	—	—	1903
	Monastir and Cavalla. *Bureau Central Mét., Paris.*	—	1905	—	—	—	1908	—	—
	Roumania (S.O. Hepites)	—	1903	—	—	—	—	—	—
	Salonika, Gymnase Bulgare ..	—	—	—	—	—	1908	—	—
	Salonika and Scutari. *K. K. Central-Anstalt für Meteorologie, Vienna.*	—	—	—	—	—	1907	—	—
	Salonika. *Observatoire Physique Central Nicolas, St. Petersburg.*	—	—	—	—	—	1910	—	—
	Sofia, Institut Météorologique Central de Bulgarie.	—	1911	1908	1908	1911	1908	—	1911
	Thera. (F. Frhr. Hiller von Gaertringen.)	—	—	1902	1902	1902	1902	—	—
dm.	**Mediterranean and Islands:—**								
	Cyprus (Blue Book)	—	—	—	—	—	1910	—	—
	Cyprus Public Works Department (Nicosia).	—	1911	—	—	—	—	—	—
	Heraklion. *Survey Department, Cairo.*	—	—	—	—	—	1908	—	—
	Malta Observatory	—	—	—	—	—	1910	—	—
	Malta and Cyprus. *Army Medical Dep., London.*	—	—	—	—	—	1906	—	—
	Malta. *Bureau Central Mét., Paris*	—	—	—	—	—	1902	—	—
	Survey Department, Cairo	—	—	—	—	—	—	—	1910
dq.	**English Channel, including Channel Islands:—**								
	Guernsey (A. Collenette)	—	1910	—	—	—	1911	—	—
	Jersey, Observatoire St. Louis ..	—	—	1911	1911	1911	—	—	—
e.	**ASIA AND MALAY ARCHIPELAGO.**								
ea.	**Asiatic Russia:—**								
	Observatoire Physique Central Nicolas (St. Petersburg).	—	—	1907	1905	1907	1907	—	—

GEOGRAPHICAL LIST—*continued.*

	NAME OF INSTITUTION, &c.	Climatology—Agricultural and Hygienic. 1710 & 1730.	Rainfall Tables. 1180.	Meteorological Observations—General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values. 1825.	Daily Weather Reports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
c.	**ASIA AND MALAY ARCHIPELAGO**—*cont.*								
caa.	**West Siberia:—**								
	Tobolsk, Tomsk. *Observatoire Physique Central Nicolas, St. Petersburg.*	—	—	—	—	1907	1907	—	—
cab.	**East Siberia:—**								
	Irkutsk, Observatoire Magnétique et Météorologique.	—	—	1905	1905	1905	1905	—	—
	Observatoire Physique Central Nicolas, St. Petersburg.	—	—	—	—	1907	1907	—	—
cac.	**Central Asiatic Russia:—**								
	Observatoire Physique Central Nicolas, St. Petersburg.	—	—	—	—	1907	1907	—	—
cb.	**China and Dependencies: Tibet, Corea:—**								
	Hong-Kong, Observatory ..	—	—	1910	1910	1911	1911	1910	—
	Chimulpo, Meteorological Observatory.	—	—	1909	—	1909	—	—	—
	Ouroumtshi, Peking. *Observatoire Physique Central Nicolas, St. Petersburg.*	—	—	—	—	—	1907	—	—
	Deutsche Seewarte, Hamburg ..	—	—	—	1909	1901	1909	—	—
	Hong-Kong and Weihaiwei. *Army Medical Dep., London.*	—	—	—	—	—	1906	—	—
	Kashgar, &c. *Meteorological Office, India (Simla).*	—	—	—	—	—	1910	—	—
	Kharbin (Manchuria), Société du chemin de fer Chinois de l'Est.	—	—	1906	1906	1906	1906	—	—
	Ou-tschang. *K. K. Central-Anstalt für Meteorologie, Vienna.*	—	—	—	—	—	1907	—	—
	Peking, Inspectorate General of Customs.	1904	—	—	—	—	—	—	—
	Tokio, Central Meteorological Observatory.	—	—	—	—	1906	—	—	—
	Tchen-Tou, Tien-Tsin, Yunnan-Sen, &c. *Bureau Central Met., Paris.*	—	1907	—	—	1908	1908	—	—
	Weihawei, Medical Officer ..	—	—	—	—	—	1906	—	—
	Zikawei, Observatoire Magnétique et Métécrologique.	—	—	1908	1908	1908	1908	1911	—
cc.	**Japanese Islands, Formosa:—**								
	Central Meteorological Observatory (Tokio).	—	—	1910	1910	1910	1910	1911	—
	Mizusawa, International Latitude Observatory.	—	—	1910	—	1910	1910	—	—
	Tsukubasan, Observatorium ..	—	—	1907	1907	1907	—	—	—
cd.	**French Indo-China: Tonquin, Annam, &c.:—**								
	Bureau Central Met., Paris ..	—	1908	1908	—	1908	1908	—	—
ce.	**Siam:—**								
	Battambang, Pnom-Penh, Vien-Tiane (Laos), &c. *Bureau Central Met., Paris.*	—	—	—	—	—	1908	—	—

GEOGRAPHICAL LIST—*continued.*

NAME OF INSTITUTION, &c.	Climatology—Agricultural and Hygienic. 1710 & 1730.	Rainfall Tables. 1180.	Meteorological Observations—General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values. 1825.	Daily Weather Reports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
e. **ASIA AND MALAY ARCHIPELAGO**—*cont.*								
ef. **British India: Himalaya, Burmah, Ceylon:—**								
Meteorological Office, India, (Simla).	—	1910	1910	—	1910	1910	1911	1910
Agricultural Department, Calcutta.	—	1909	—	—	—	—	—	—
Meteorological Office, Bengal, Calcutta.	—	1907	1909	—	—	1909	1911	1909
Observatory, Colombo	—	—	1910	—	—	1911	—	—
Allahabad, Meteorological Office	—	1910	—	—	—	1910	—	—
Bangalore, Mysore Government Meteorological Department.	—	1909	1909	—	1909	1909	—	—
Bombay, Government Observatory.	—	—	1905	—	1905	—	—	—
Ceylon, Royal Botanic Gardens	—	1903	—	—	—	—	—	—
Kodaikánal, Observatory ..	—	—	—	—	—	1910	—	—
Meteorological Reporter to Government, Punjab.	—	—	—	—	—	1910	—	.910
Karikal, Pondichery, Yanaon (Madras Pres.), &c. *Bureau Central Mét., Paris.*	—	—	—	—	—	1908	—	—
eg. **Malay Peninsula and Archipelago, Philippines, &c.:—**								
Royal Magnetical and Meteorological Observatory (Batavia).	—	1909	1907	1907	—	1907	—	—
Philippine Weather Bureau, Manila Central Observatory.	—	—	1907	1907	1910	—	—	1910
Principal Civil Medical Officer, Straits Settlements (Singapore).	—	1904	1909	—	1909	1909	—	—
British North Borneo (British N. Borneo Herald).	—	—	—	—	1911	—	—	—
Buitenzorg, Institut Botanique de l'Etat.	—	—	—	—	1909	—	—	—
Federated Malay States (Govt. Gazette).	—	—	—	—	—	1910	—	—
Penang, Singapore. *Meteorological Office, India (Simla).*	—	—	—	—	—	1910	—	—
Singapore. *Army Medical Dep., London.*	—	—	—	—	—	1906	—	—
eh. **Persia, Afghanistan, Baluchistan, Pamirs:—**								
Bushire, Ispahan, Jask, Kabul, Quetta, &c. *Meteorological Office, India (Simla).*	—	—	—	—	—	1910	—	—
Bushire. *Bureau Central Mét., Paris.*	—	—	—	—	—	1905	—	—
Enzeli, Khousseinabad (Seistan). *Observatoire Physique Central Nicolas, St. Petersburg.*	—	—	—	—	—	1907	—	—
ei. **Asiatic Turkey, Arabia, Syria:—**								
Aden, Baghdad, Bahrein, Busrah, Muscat, Beyrout. *Meteorological Office, India (Simla).*	—	—	—	—	—	1910	—	—
Babylon. *Deutsche Seewarte, Hamburg.*	—	—	—	—	—	1909	—	—
Beyrout, Jerusalem, &c. *K. K. Central-Anstalt für Meteorologie, Vienna.*	—	—	1907	—	1907	1907	—	—

GEOGRAPHICAL LIST—*continued.*

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e. **ASIA AND MALAY ARCHIPELAGO**—*cont.*								
ei. **Asiatic Turkey, Arabia, Syria**—*cont.*								
Hebron. *Scottish Met. Soc., Edinburgh.*	—	—	—	—	—	1910	—	—
Ksara (Liban), Observatoire ..	—	—	—	—	1911	—	—	—
El Athroun, Le Krey (Syria), Smyrna, and other stations. *Bureau Central Mét., Paris.*	—	—	—	—	1908	1908	—	—
Scutari. *Army Medical Dep., London.*	—	—	—	—	—	1906	—	—
Sinope. *Observatoire Physique Central Nicolas, St. Petersburg.*	—	—	—	—	—	1907	—	—
Smyrna. *Survey Department, Cairo.*	—	—	—	—	—	1908	—	—
f. **AFRICA AND MADAGASCAR.**								
fa. **Mediterranean States: Morocco, Algiers, Tunis, Tripoli:—**								
Service Météorologique du Gouvernement Général de l'Algérie.	—	—	—	—	—	—	1911	—
Algeria and Tunis, Benghazi (Tripoli), Tangier, Mazagan. *Bureau Central Mét., Paris.*	—	—	1908	—	1908	1908	—	—
Casablanca, Mogador, Saffi, Marrakesch. *Deutsche Seewarte, Hamburg.*	—	—	—	—	—	1909	—	—
Tripoli. *Ufficio Centrale Met. e Geodinam. Ital., Rome.*	—	—	—	—	—	1905	—	—
fb. **North-east Africa: Egypt, Nile Valley to 5° N., Abyssinia:—**								
Survey Department, Cairo ..	—	1909	1908	1908	1908	1908	1911	1910
Department of Public Health, Cairo.	1911	—	—	—	1911	—	—	1911
Egyptian Sudan. *Meteorological Office, London.*	—	—	—	—	—	1902	—	—
Adis-Abéba (Abyssinia). *Observatoire Physique Central Nicolas, St. Petersburg.*	—	—	—	—	1906	1906	—	—
Berbera, Somaliland	—	—	1910	—	1910	1910	—	—
Khartoum. *Army Medical Dep., London.*	—	—	—	—	—	1904	—	—
Ismailia, Port Said, Suez, Adis-Abeba (Abyssinia). *Bureau Central Mét., Paris.*	—	—	—	—	1908	1908	—	—
fc. **Sahara and the Central Sudan:—**								
Fort Lamy (Tchad), &c. *Bureau Central Mét., Paris.*	—	—	—	—	—	1908	—	—
fd. **West Africa, including French Sudan, from Morocco to the Congo:—**								
Mitteilungen aus den Deutschen Schutzgebieten.	—	—	—	—	—	1909	—	—
Accra, Observatory	—	—	—	—	—	1910	—	—
Gambia, Medical Officer	—	—	—	—	1911	—	—	—
Gambia. (Blue Book)	—	—	1910	—	1910	1910	—	—

GEOGRAPHICAL LIST—*continued.*

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AFRICA AND MADAGASCAR —*cont.*								
West Africa, including French Sudan, from Morocco to the Congo—*cont.*								
Lagos, Survey Department ..	1910	—	—	—	..	1911	—	—
Northern Nigeria. (Blue Book)	—	—	1910	—	1910	1910	—	—
Sierra Leone (Freetown)	—	—	1910	—	1910	1910	—	—
Southern Nigeria Government Gazette.	1909	—	—	—	—	—	—	—
Togo (P. Heidke)	—	—	—	—	—	1910	—	—
Zungeru (Northern Nigeria), Principal Medical Officer.	1909	—	1909	—	1909	1909	—	—
Sierra Leone, Accra, Cape Coast, Kumasi. *Army Medical Dep., London.*	—	—	—	—	—	1906	—	—
Dahomey, French Guinea, French Sudan, Ivory Coast, Senegal. *Bureau Central Mét., Paris.*	—	—	—	—	1908	1908	—	—
Dahomey, Mundame (Cameroon). *Deutsche Seewarte, Hamburg.*	—	—	—	—	1909	1909	—	—
Congo State and Angola:—								
Akka (*Meteorological Office, London*).	—	—	—	—	—	1902	—	—
Ka-Tanga, Mission Scientifique	—	—	1899	1899	—	—	—	—
Lambaréné, Libreville and other stations. *Bureau Central Mét., Paris.*	—	—	—	—	1906	1908	—	—
East Africa; British (with Uganda); German; Portuguese (north of the Zambesi); British Central Africa; Lake Region.								
Mitteilungen aus den Deutschen Schutzgebieten.	—	—	—	—	—	1909	—	—
British East Africa .. (*Meteorological Office, London.*)	—	—	—	—	—	1902	—	—
British Central Africa (*Meteorological Office, London.*)	—	—	—	—	—	1902	—	—
Rhodesia .. .. (*Meteorological Office, London.*)	—	—	—	—	—	1902	—	—
Uganda .. .. .. (*Meteorological Office, London.*)	—	—	—	—	—	1902	—	—
German East Africa. *Deutsche Seewarte, Hamburg.*	—	—	—	1909	1909	1908	—	—
British East Africa Agricultural Department (Nairobi).	—	—	—	—	—	1910	—	1905
Boroma and Zumba. *Haynald Observatorium, Kalocsa.*	—	—	1897	1897	1897	—	—	—
Entebbe, Uganda Protectorate. (Blue Book).	—	—	—	—	—	1910	—	—
Mombasa. *Army Medical Dep., London.*	—	—	—	—	—	1903	—	—
Rhodesia. *Government Statist and Agricultural Department.*	—	—	—	—	—	1908	—	—
Uganda Protectorate, Scientific and Forestry Department (Entebbe).	—	—	—	—	1905	1910	—	—
Zanzibar. *Meteorological Office, India (Simla).*	—	—	—	—	—	1910	—	—
Zomba, Forestry and Botanical Department.	—	1903	—	—	1910	1909	—	—
South Africa—South of Angola and the Zambesi:—								
Meteorological Commission (Cape Town).	—	1908	1908	1902	—	1908	—	—
Transvaal Meteorological Department (Johannesburg).	—	1911	1910	1910	1910	—	1911	1911

GEOGRAPHICAL LIST—*continued.*

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f.* AFRICA AND MADAGASCAR—*cont.								
fg.* South Africa—South of Angola and the Zambesi—*cont.								
Beira, Observatorio Meteorologico.	—	—	—	—	1910	—	—	—
Bulawayo (E. Goetz)	—	—	—	—	—	1904	—	—
Durban, Natal Observatory ..	—	1902	1908	—	1908	1908	—	—
Farm Otjikango, Damara. *Deutsche Seewarte, Hamburg.*	—	—	—	—	1909	—	—	—
Fort Napier (Natal), Pretoria. *Army Medical Dep., London.*	—	—	—	—	—	1906	—	—
German S.W. Africa (E. Ottweiler).	—	1905	—	—	—	—	—	—
Loanda, Observatorio	—	—	—	—	—	1909	—	—
Southern Rhodesia, &c. *Meteorological Office, London.*	—	—	—	—	—	1902	—	—
Mitteilungen aus den Deutschen Schutzgebieten.	—	—	—	—	—	1909	—	—
***fh.* Madagascar and Comoro Group:—**								
Tananarive, Observatoire ..	—	—	1910	1910	1910	1910	—	—
Bureau Central Mét., Paris ..	—	1908	—	—	1908	1908	—	—
***fi.* Red Sea and Islands:—**								
K. Akademie der Wissenschaften, Vienna.	—	—	—	[1903]	[1903]	—	—	—
Perim. *Meteorological Office, India (Simla).*	—	—	—	—	—	1910	—	—
***g.* NORTH AMERICA.**								
***gb.* Canada as a whole:—**								
Meteorological Service, Dominion of Canada (Toronto).	—	—	1907	1907	1907	1907	1911	1911
Toronto Observatory	—	—	—	—	—	1908	—	—
U.S. Weather Bureau, Washington	—	—	—	—	—	1910	—	—
***gc.* Canadian Dominion West.**								
Alberta (Official Handbook) ..	—	—	—	—	—	1906	—	—
Edmonton, Department of Agriculture,	—	—	—	—	—	1909	—	—
Regina, Department of Agriculture.	—	—	—	—	—	1905	—	—
***gd.* Canadian Dominion East: Newfoundland, Labrador:—**								
Toronto, Bureau of Industries ..	—	—	1904	—	—	—	—	—
Hebron, Nain, *Deutsche Seewarte, Hamburg.*	—	—	—	—	—	1909	—	—
St. Pierre and Miquelon, *Bureau Central Mét., Paris.*	—	1905	—	—	—	1902	—	—
St. Croix, *Dansk Meteorologisk Institut, Copenhagen.*	—	—	—	—	—	1908	—	—
***gf.* United States as a whole:—**								
U.S. Weather Bureau, Department of Agriculture, Washington.	—	—	1910	1901	1907	1910	1911	1910

GEOGRAPHICAL LIST—*continued.*

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g. **NORTH AMERICA**—*cont.*								
gg. **North-Eastern United States, East of Mississippi:—**								
Cambridge (Mass.), Astronomical Observatory of Harvard College.	—	—	—	—	1908	—	—	—
New York, Meteorological Observatory.	—	—	—	1911	—	—	—	—
Washington, United States Naval Observatory.	—	—	—	—	1902	—	—	—
gi. **Western United States, West of Mississippi:—**								
Colorado Springs, Colorado College, Observatory.	—	—	—	—	1907	1907	—	—
gl. **Mexico:—**								
Dirección General de Telégrafos Federales (Mexico).	—	—	—	—	—	—	1904	—
Observatorio Meteorológico Central (Mexico).	—	—	1910	1910	1910	—	—	1910
Guadalajara, Observatorio del Seminario Conciliar.	—	—	—	—	1906	—	—	—
Leon, Observatorio Meteorológico.	—	—	—	—	1911	—	—	1911
Morelia, Observatorio Meteorológico.	—	—	1910	—	1910	1910	—	—
Oaxaca (A. M. Dominguez) ..	—	1903	—	—	—	—	—	—
Oaxaca, Observatorio Meteorológico.	—	—	—	—	1908	—	—	1908
Puebla, Boletin de Estadistica..	1910	—	—	—	1910	—	—	—
Saltillo, Observatorio Meteorológico del Colegio de San Juan Nepomucino.	—	—	—	—	1905	—	—	—
Tacubaya, Observatorio Astrónomico Nacional.	—	—	1897	—	1897	1897	—	—
U.S. Weather Bureau, Washington.	—	—	—	—	—	1910	—	—
Zacatecas, Observatorio	—	—	1911	—	1911	1911	—	—
h. **CENTRAL AND SOUTH AMERICA AND WEST INDIES.**								
hb. **Central America, &c.:—**								
Belize, Colonial Surgeon	1911	—	—	—	1911	—	—	—
Costa Rica, *U.S. Weather Bureau, Washington.*	—	—	—	1910	—	—	—	—
San Salvador, Observatorio Meteorologico y Astronomico.	—	—	—	—	—	1902	—	—
Tegucigalpa, Laboratorio Central	—	—	—	—	1905	—	—	—
hc. **West Indian Islands, Caribbean Sea, Gulf of Mexico:—**								
Antigua, Government Laboratory.	—	1910	—	—	1911	1910	—	—
Bahamas	—	—	—	—	1902	1910	—	—
Barbados, Department of Agriculture.	—	—	—	—	—	1909	—	—
Barbados, St. Lucia, Jamaica, Bermuda. *Army Medical Dep., London.*	—	—	—	—	—	1906	—	—
Bermuda, *Meteorological Service of Canada, Toronto.*	—	—	—	—	—	1907	—	—

GEOGRAPHICAL LIST—*continued.*

NAME OF INSTITUTION, &c.	Climatology—Agricultural and Hygienic. 1710 & 1730.	Rainfall Tables. 1180.	Meteorological Observations—General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values. 1825.	Daily Weather Reports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
h. CENTRAL AND SOUTH AMERICA AND WEST INDIES—*cont.*								
hc. West Indian Islands, Caribbean Sea, Gulf of Mexico—*cont.*								
Bermuda, Registrar-General ..	1903	—	—	—	—	1909	—	—
Bermuda (Prospect)	—	—	—	—	1911	—	—	—
Dominica, Botanic Station ..	—	1907	—	—	—	—	—	—
Grenada, Carriacou Observatory	—	—	—	—	1910	—	—	—
Grenada, Richmond Hill Observatory.	—	1910	—	—	1911	1910	—	—
Guadeloupe, Haiti, Martinique. *Bureau Central Mét., Paris.*	—	—	—	—	1908	1908	—	—
Havana, Observatorio del Colegio de Belen.	—	—	1910	—	1910	1910	—	—
Havana, Secretaria de Agricultura, &c.	1910	—	1910	—	1910	1910	—	—
Jamaica, Weather Office, Kingston.	—	1910	1910	—	—	1910	—	1910
Port-au-Prince, (Haiti.) *K. K. Central-Anstalt für Meteorologie, Vienna.*	—	—	1907	—	1907	1907	—	—
St. Lucia, Agricultural Superintendent.	—	1911	—	—	—	—	—	—
St. Lucia Botanic Gardens ..	—	1910	—	—	—	1910	—	—
St. Lucia, Harbour Master ..	—	—	—	—	1911	—	—	—
St. Vincent, Botanic Gardens ..	—	1907	1903	—	—	1911	—	—
U.S. Weather Bureau, Washington	—	—	—	—	—	1910	—	—
hd. Guiana—British, Dutch, and French; Venezuela; Trinidad:—								
Cayenne. *Bureau Central Mét., Paris.*	—	—	—	—	1908	1908	—	—
Georgetown, Demerara, Botanic Gardens.	—	—	—	—	1911	1911	—	—
Paramaribo. *K. Nederlandsch Meteorologisch Instituut, de Bilt.*	—	—	—	—	1904	—	—	—
Trinidad, Royal Botanic Gardens	—	1908	1910	—	1910	1910	—	—
hf. Peru:—								
Astronomical Observatory of Harvard College, Cambridge (Mass.).	—	—	—	1895	1895	—	—	—
Piura. *Deutsche Seewarte, Hamburg.*	—	—	—	—	—	1906	—	—
hg. Bolivia:—								
Madidi. *Bureau Central Mét., Paris.*	—	—	—	—	—	1903	—	—
Puerto Cobija, *Deutsche Seewarte, Hamburg.*	—	—	—	—	—	1909	—	—
hh. Brazil:—								
Ministerio de Marinha, Directoria de Meteorologia, Rio Janeiro.	—	—	1904	1904	1906	—	—	—
Curityba, Observatorio Meteorologico.	—	—	—	—	—	1910	—	—
Cuyabá, Observatorio Meteorologico "D. Bosco."	—	—	—	—	1910	..	—	—
Descalvados. *Deutsche Seewarte, Hamburg.*	—	—	—	1906	—	1906	—	—
Para Prata. *K. K. Central-Anstalt für Meteorologie, Vienna.*	—	—	—	—	1906	—	—	—
Rio Janeiro, Observatorio ..	—	—	1908	—	1908	1908	—	—
Sao Paulo, Secretaria da Agricultura, &c.	—	—	—	—	—	1905	—	—

GEOGRAPHICAL LIST—*continued.*

NAME OF INSTITUTION, &C.	Climatology—Agricultural and Hygienic. 1710 & 1730.	Rainfall Tables. 1180.	Meteorological Observations—General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values. 1825.	Daily Weather Reports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
CENTRAL AND SOUTH AMERICA AND WEST INDIES—*cont.*								
Argentina, Uruguay, and Paraguay:—								
Oficina Meteorológica Argentina (Buenos Aires).	—	—	—	—	—	—	1911	—
Dirección General del Servicio Meteorológico Nacional, Monte Video.	—	1905	—	—	—	1905	—	—
Direccion General de Estadistica del Uruguay, Monte Video.	1906	—	—	—	—	1906	—	—
Fray Bentos. *Deutsche Seewarte, Hamburg.*	—	—	—	—	—	1893	—	—
Monte Video, Observatorio National Fisico-Climatologico.	—	—	—	1909	1909	—	—	1909
Monte Video, Instituto Meteorologico Nacional.	—	—	—	—	—	1910	—	—
Villa Colón, Observatorio Meteorológico.	—	—	—	1902	1902	1906	—	1902
Chili:—								
Servicio Meteorolójico de la Direccion del Territorio Maritimo (Valparaiso.)	—	—	1908	—	1908	1908	—	—
Punta Arenas, Observatorio Meteorológico del Colegio Salesiano "S. José."	—	1902	1907	1907	1910	1907	—	—
Santiago, Observatorio Astronómico.	—	—	1909	—	—	1909	—	—
Falkland Islands:—								
Stanley	—	—	—	—	—	1911	—	—
i. **AUSTRALASIA.**								
Sydney Observatory	—	—	—	—	—	—	1909	—
New Guinea:—								
Papua (Government Gazette) ..	—	—	—	—	—	1909	—	—
Bismarck Archipelago:—								
Rakuranga. *Deutsche Seewarte, Hamburg.*	—	—	—	—	—	1909	—	—
Australia:—								
Central Weather Bureau, Melbourne.	—	1908	—	—	—	—	1911	—
Queensland:—								
Brisbane, Government Statistician's Office.	1905	—	—	—	—	1905	—	—
Brisbane, Weather Bureau ..	—	—	—	—	—	1907	—	—
New South Wales:—								
Sydney, Department of Public Instruction.	—	1902	—	—	1902	1902	—	—
Central Weather Bureau, Melbourne.	—	1908	1908	—	—	—	—	—
Windsor (John Tebbutt)	—	—	—	—	—	1903	—	—

GEOGRAPHICAL LIST—*continued.*

NAME OF INSTITUTION, &c.	Climatology—Agricultural and Hygienic. 1710 & 1730.	Rainfall Tables. 1180.	Meteorological Observations—General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values. 1825.	Daily Weather Reports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
i.* AUSTRALASIA—*cont.								
***ig.* South Australia:—**								
Adelaide Observatory	—	1905	1905	—	1905	1905	—	—
***ih.* West Australia:—**								
Perth, Observatory	—	1908	1907	—	1907	1907	—	1906
Perth, Government Statistician's Office.	—	1909	1909	—	—	1909	—	—
***ik.* New Zealand:—**								
Wellington, Meteorological Office	—	1908	1908	—	1908	1910	1905	—
Wellington, Government Observatory.	—	—	—	—	1904	—	—	—
***il.* New Caledonia, New Hebrides, and Loyalty Islands:—**								
Noumea, Paita (N. Cal.), Port Vila (New Hebrides). *Bureau Central Mét., Paris.*	—	1908	—	—	1908	1908	—	—
***k.* ARCTIC.**								
***ka.* Arctic Ocean:—**								
Ziegler Polar Expedition, 1903-5 ..	—	—	—	—	1905	—	—	—
Netherlands Polar Expedition ..	—	—	1882-3	1882-3	—	—	—	—
***kb.* Greenland:—**								
Dansk Meteorologisk Institut (Copenhagen).	—	—	1908	—	1908	1908	—	—
***kd.* Islands north of Europe and Asia:—**								
Norwegian North Polar Expedition [H. Mohn].	—	—	1896	1896	1896	—	—	—
Spitzbergen (J. Westman) ..	—	—	—	1900	—	—	—	—
***l.* ATLANTIC.**								
***lb.* Azores, Canaries, Madeira, Cape Verde:—**								
Service Météorologique des Açores, Ponta Delgada.	—	—	1909	1909	—	1909	—	—
Teneriffe, Las Palmas. *Instituto Central Meteorológico, Madrid.*	—	—	—	—	—	1908	—	—
Teneriffe, Las Palmas. *Observatorio Do Infante D. Luiz, Lisbon.*	—	—	—	—	—	1905	—	—
Teneriffe, Las Palmas. *Bureau Central Mét., Paris.*	—	—	—	—	—	1908	—	—
Teneriffe (Puerto de Orotava), *Deutsche Seewarte, Hamburg.*	—	—	—	—	—	1909	—	—
***m.* INDIAN OCEAN.**								
***ma.* Ocean and Islands north of Equator:—**								
Amini Divi, Minicoy. *Meteorological Office, India (Simla).*	—	—	—	—	—	1910	—	—
***mb.* Ocean and Islands south of Equator:—**								
Christmas Island. *Scottish Met. Soc., Edinburgh.*	—	—	—	—	—	1910	—	—
Christmas Island. Straits Settlements Gazette.	—	—	—	—	1910	—	—	—

GEOGRAPHICAL LIST—*continued.*

	NAME OF INSTITUTION, &C.	Climatology—Agricultural and Hygienic. 1710 & 1730.	Rainfall Tables. 1180.	Meteorological Observations—General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values 1825.	Daily Weather Reports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
	m.* INDIAN OCEAN—*cont.								
mb.	**Ocean and Islands south of Equator—*cont.***								
	Cocos, Keeling Islands. *Observatory, Perth, W.A.*	—	—	—	—	—	1907	—	—
	Mauritius, Royal Alfred Observatory.	—	—	1910	1905	1910	—	—	1910
	Mauritius. *Army Medical Dep., London.*	—	—	—	—	—	1903	—	—
	Mauritius, Seychelles, Diego Garcia. *Meteorological Office, India (Simla).*	—	—	—	—	—	1910	—	—
	Réunion. *Bureau Central Mét., Paris.*	—	1907	—	—	—	1908	—	—
	Seychelles (Blue Book)	—	—	1910	—	1910	1910	—	—
	***n.* PACIFIC.**								
nd, ne.	**Pacific Islands North of Equator:—**								
	Honolulu (R. C. Lydecker) ..	—	—	—	—	1903	—	—	—
	Honolulu. *U.S. Weather Bureau, Washington.*	—	—	—	—	1910	—	—	—
	Caroline, Gilbert and Marshall Islands. *Deutsche Seewarte, Hamburg.*	—	—	—	—	—	1909	—	—
nf, nh.	**Pacific Islands South of Equator:—**								
	Samoa Observatorium	—	—	1906	1906	—	1906	—	—
	Samoa and Cook Islands. *Deutsche Seewarte, Hamburg.*	—	—	—	—	1906	1909	—	—
	Suva, Department of Agriculture	—	—	—	—	—	1909	—	—
	Suva, Fiji (J. D. W. Vaughan) ..	—	—	—	—	1905	—	—	—
	Tahiti, Rikitea (Mangareva). *Bureau Central Mét., Paris.*	—	1908	—	—	1904	1907	—	—
	***o.* ANTARCTIC.**								
ob.	**S. Georgia, and Islands S. of S. Atlantic:—**								
	Schwedische Südpolar Expedition (Snow Hill).	—	—	1903	1903	—	—	—	—
	Petermann Island (J. Rouch) ..	—	—	—	—	—	1909	—	—
oc.	**Islands South of Indian Ocean:—**								
	Deutsche Südpolar Expedition, Winterstation des "Gauss."	—	—	1903	1903	1903	—	—	—
od.	**Islands to Southward and South-East of New Zealand:—**								
	National Antarctic Expedition, 1901-1904.	—	—	1904	1904	1904	—	—	—

LIST OF CURRENT METEOROLOGICAL PERIODICALS AND JOURNALS CONTAINING OCCASIONAL ARTICLES ON METEOROLOGICAL SUBJECTS RECEIVED FOR THE OFFICE LIBRARY.

Annales de l'Observatoire Municipal, Paris.
Annales du Bureau Central Météorologique de France.
†**Annalen** der Hydrographie und maritimen Meteorologie.
Annali dell' Ufficio Centrale Meteorologico e Geodinamico Italiano.
Annuaire de la Société Météorologique de France.

†Annuaire Météorologique de l'Observatoire Royal de Belgique.
Astrophysical Journal.
Aus dem Archiv der Deutschen Seewarte.
Australian Monthly Weather Report.
†Beiträge zur Physik der freien Atmosphäre.
Boletín mensual del Observatorio meteorológico central de Mexico.
Bollettino bimensuale della Societa Meteorologica Italiana.
Botanical Journal.
†Bulletin of the Mount Weather Observatory.
Bulletin of the Philippine Weather Bureau.
†Bulletin de l'Institut Aerodynamique de Koutchino.
Cairo Scientific Journal.
†Ciel et Terre.
Comptes rendus hebdomadaires des séances de l'Académie des Sciences, Paris.
†Das Wetter.
Geographical Journal.
Globe (Le), Journal Géographique.
Indian Meteorological Memoirs.
Jahrbuch der Astronomie und Geophysik (H. J. Klein).
Journal of the Franklin Institute.
Journal of the Meteorological Society of Japan.
Journal of the Royal United Service Institution.
Journal of the Scottish Meteorological Society.
Journal of the Royal Society of Arts.
London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science.
Memoirs and Proceedings of the Manchester Literary and Philosophical Society.
Memorias de Sociedad Cientifica "Antonio Alzate," Mexico.
Meteorologische Zeitschrift.
Mitteilungen aus dem Gebiete des Seewesens, Pola.
Monthly Meteorological Bulletin of the Nicolas Central Physical Observatory.
Monthly Notices of the Royal Astronomical Society.
Monthly Weather Review of the U.S. Weather Bureau.
Nature.
Nature (La).
Nautical Magazine.
Oversigt over det Kongelige danske Videnskabernes Selskab Forhandlinger.
Petermann's (Dr. A.) Mitteilungen aus Justus Perthes' Geographischer Anstalt.
Proceedings of the American Philosophical Society.
Proceedings of the Cambridge Philosophical Society.
Proceedings of the Royal Institution.
Proceedings of the Royal Irish Academy.
Proceedings of the Royal Society of Edinburgh.
Proceedings of the Royal Society of London.
Quarterly Journal of the Royal Meteorological Society.
Scientific Proceedings of the Royal Dublin Society.
Scottish Geographical Magazine.
Smithsonian Contributions to Knowledge.
Smithsonian Miscellaneous Collections.
†Symons's Meteorological Magazine.
Tijdschrift van het Koninklijk Nederlandsch Aardrijkskundig Genootschap.

In addition to the works summarised in the above lists, a large number of books and pamphlets dealing with meteorological subjects have been received. Some of the more important are referred to on p. 42 of the Report.

The compilation of a complete bibliography of meteorological literature is included in the objects of the International Catalogue of Scientific Literature, and the necessity for the publication in full of the titles of all books and pamphlets received at the office is thereby obviated. It is intended to deal with the matter in due course in connexion with the catalogue of the Library.

APPENDIX VIII.

List of Institutions receiving Publications issued by the Committee.

Observers contributing returns printed in one of the periodical publications receive a copy of the publication. The Committee request that the copies may be returned to the Office after the observer has no personal use for them, in cases where they are not filed in a public library or other institution where the public can consult them.

The *Daily Weather Report* is sent to seaports and to a few places in London for exhibition.

The *Annual Report* is sent to all observers at land stations in connexion with the Office who express a wish to receive it.

Periodical or occasional publications are sent to the institutions named in the following list, generally speaking, in exchange for publications received.

United Kingdom.	
Public Offices:	
Aberdeen ...	B.T., Supt. M.M.O.
Avonmouth	B.T., Supt. M.M.O.
Barrow-in-Furness.	Sueter, Capt. R.N.
Barry ...	B.T. Surveyor.
Belfast ...	B.T., Supt. M.M.O.
Blyth ...	B.T., Supt. M.M.O.
Bristol ...	B.T., Supt. M.M.O.
Cardiff ...	B.T., Supt. M.M.O.
Dartmouth	Admiralty, Royal Naval College.
	B.T., Supt. M.M.O.
Dublin ...	Board of Agriculture and Technical Instruction.
	General Register Office.
	Ordnance Survey Office.
Dundee ...	B.T., Supt. M.M.O.
Edinburgh...	Board of Fisheries.
	General Register Office.
	H.M. Office of Works.
	Royal Observatory.
	*†Royal Scottish Museum.
Farnborough	School of Ballooning.
	Balloon Factory.
Glasgow ...	B.T., Supt. M.M.O.
Gloucester	B.T., Supt. M.M.O.
Greenock ...	B.T., Supt. M.M.O.
Grimsby ...	B.T., Supt. M.M.O.
Hartlepool	B.T., Supt. M.M.O.
Hull ...	B.T., Supt. M.M.O.
Leith ...	B.T., Supt. M.M.O.
Liverpool ...	B.T., Supt. M.M.O.
London ...	Admiralty, Hydrographer.
	—— Librarian.
	*†—— Greenwich Royal Naval College.
	—— Greenwich Royal Observatory.

United Kingdom—*cont.*	
Public Offices —*cont.*	
London ...	Admiralty, Superintendent of Compasses.
	Army Medical Department.
	Board of Agriculture.
	—— (Fisheries Division).
	*†Board of Education, Science Library.
	—— Science Museum.
	—— Solar Physics Observatory.
	Board of Trade, Consultative Branch.
	—— Fisheries and Harbour Department.
	—— Marine Department.
	—— Standard Weights and Measures Department.
	—— Supt. M.M.O. Dock Street.
	—— Supt. M.M.O. Poplar.
	—— Supt. M.M.O. Tilbury.
	—— Supt. M.M.O. Victoria Docks.
	—— Surveyor.
	British Museum, Dept. of Printed Books.
	Chinese Maritime Customs.
	General Post Office.
	General Register Office.
	*Imperial Institute.
	Kew Gardens.
	Local Government Board.

* Receive all publications, including the Daily Weather Report in those cases which are also marked †.

List of Institutions receiving Publications—*cont.*

United Kingdom—*cont.*	
Public Offices —*cont.*	
London ...	National Physical Laboratory (Bushy House).
	—— (Kew Obs.).
	—— (Eskdalemuir).
	Trinity House.
Manchester	B.T., Supt. M.M.O.
Middlesbrough.	B.T., Supt. M.M.O.
Newcastle-on-Tyne.	B.T., Supt. M.M.O.
Newport ...	B.T., Supt. M.M.O.
Plymouth ...	B.T., Supt. M.M.O.
Shields North.	B.T., Supt. M.M.O.
Shields South.	B.T., Supt. M.M.O.
Shrewsbury	Ordnance Survey Office
Southampton.	B.T., Supt. M.M.O.
	Ordnance Survey Office.
Sunderland	B.T., Supt. M.M.O.
Swansea ...	B.T., Supt. M.M.O.
Institutions:	
Aberdeen ...	Observatory.
Aberystwyth	The University.
Alnwick ...	Duke of Northumberland's Observatory.
Armagh ...	Observatory.
Aspatria ...	Royal Agricultural College.
Belfast ...	Queen's College.
	University.
BexleyHeath	Editor, Findlay's Sailing Directions.
Bidston ...	Liverpool Observatory.
Birkenhead	"Conway" Training Ship.
Birmingham	Central Free Library.
	Midland Institute.
	University, Librarian.
Birr Castle...	Observatory.
Cambridge...	The Agricultural Department.
	Botanic Garden.
	Cavendish Laboratory.
	Observatory.
	Philosophical Society.
	University Library.
Cardiff ...	University College.
Cirencester...	Royal Agricultural College.
Dublin ...	Astronomer Royal.
	Dunsink Observatory.
	Royal Dublin Society.
	Royal Irish Academy.
	Trinity College.
Dundee ...	Chalmers, Capt. (Agent).
	International Commission for Investigation of North Sea.
	University College.
Durham ...	Observatory.

United Kingdom—*cont.*	
Institutions— *cont.*	
Edinburgh...	Royal Botanic Garden.
	Royal Observatory.
	Royal Scottish Geographical Society.
	Royal Society.
	*†Scottish Meteorological Society.
	University Library.
	University, Physical Laboratory.
Falmouth ...	Observatory.
	Royal Cornwall Polytechnic Society.
Glasgow ...	"Nautical Magazine."
	Observatory.
	University Library.
Greenhithe	"Worcester" Training Ship.
Hull ...	Shipmasters' Association.
Jersey ...	St. Louis Observatory.
Kingstown...	Municipal Library.
Leeds ...	University, Librarian.
Leith ...	Nautical College.
Liverpool ...	Free Public Library.
	Mercantile Marine Service Association.
	Nautical College.
	Richardson, Spence & Co.
	Sargeant, Capt. (Agent).
	Underwriters' Rooms.
	University, Physical Laboratory.
	University, Zoological Department.
London ...	Aeronautical Journal.
	Aeronautical Society.
	British Association.
	*†British Rainfall Organisation.
	Eastern Telegraph Co.
	"Engineering."
	*Guildhall Library.
	Institution of Civil Engineers.
	Institution of Electrical Engineers.
	Institution of Mechanical Engineers.
	Institution of Mining Engineers.
	Institution of Naval Architects.
	Iron and Steel Institute.
	*†Lloyd's.
	London Institution.
	London School of Economics.
	Metropolitan Water Board.
	"Nature."
	Navigation School.

* Receive all publications, including the Daily Weather Report in those cases which are also marked †.

List of Institutions receiving Publications—*cont.*

United Kingdom—*cont.*

Institutions—*cont.*	
London ...	Physical Society.
	Richmond Free Public Library.
	Royal Astronomical Society.
	Royal Botanic Society.
	Royal College of Science.
	Royal Geographical Society.
	Royal Institution of Great Britain.
	*†Royal Meteorological Society.
	Royal National Lifeboat Institution.
	Royal Society.
	Royal Society of Arts.
	Royal Society of Medicine.
	*Royal United Service Institution.
	"Shipping Gazette."
	University College, Librarian.
	University College, Physical Department.
Manchester	Philosophical Society.
	The University.
	University, Meteorological Department.
Markree ...	Observatory.
Newcastle-on-Tyne.	Armstrong College.
Northampton	Natural History Society.
Oxford ...	Bodleian Library.
	Clifton, Prof. R. B.
	Radcliffe Observatory.
	School of Geography.
	University Observatory.
Paisley ...	Coats Observatory.
Plymouth ...	Incorporated Chamber of Commerce.
	Marine Biological Laboratory.
Redruth ...	Free Public Library.
Southampton	Forbes, Capt. (Agent).
Southport ...	Fernley Observatory.
South Shields.	Marine Schools.
Stamford ...	Free Library.
Stonyhurst	Observatory.
Torquay ...	Natural History Society.
Valencia ...	Observatory.
York ...	Philosophical Society.

British Colonies and Dependencies.

Australasia.

Adelaide ...	Commonwealth Bureau of Meteorology.
	Government Astronomer.

British Colonies and Dependencies—*cont.*

Australasia—cont.

Adelaide ...	Public Library.
Brisbane ...	Commonwealth Bureau of Meteorology.
	Public Library.
Christchurch...	Observatory.
Hobart ...	Commonwealth Bureau of Meteorology.
Melbourne ...	*†Commonwealth Bureau of Meteorology.
	Commonwealth Statistical Bureau.
	Department of Agriculture.
	Observatory.
	Public Library.
Perth	Astronomical Observatory.
	Commonwealth Bureau of Meteorology.
	Land and Survey Department.
Sydney ...	Commonwealth Bureau of Meteorology.
	Government Observatory.
	Public Library.
	Royal Society of New South Wales.
Wellington ...	Colonial Museum.
Windsor ...	Observatory.

Canada.

Halifax (Nova Scotia).	Nova Scotian Institute of Science.
Montreal ...	McGill University.
Ottawa ...	Observatory.
Toronto ..	*†Meteorological Office.
Victoria (B.C.)	Meteorological Office.

India and Eastern Asia.

Allahabad ...	Meteorological Reporter.
Bangalore ...	Meteorological Department.
Bombay ...	Observatory.
Calcutta ...	Director General of Observatories.
	Surveyor General.
Colombo ...	Observatory.
Dehra Dun ...	Trigonometrical Survey.
Hong Kong ...	Observatory.
Kodaikanal ...	Observatory.
Simla	Director General of Observatories.
Singapore ...	Principal Civil Medical Officer.

Mediterranean.

Malta	Observatory.

* Receive all publications, including the Daily Weather Report in those cases which are also marked †.

List of Institutions receiving Publications—*cont.*

British Colonies and Dependencies—*cont.*

South Africa.

Bloemfontein	Grey College.
Cape Town ...	Observatory.
	Meteorological Commission.
Johannesburg	The Union Observatory.
Pretoria ...	Chief Meteorologist, Department of Irrigation.

Indian Ocean.

Mauritius ...	Meteorological Society.
	Royal Alfred Observatory.

West India Islands.

Jamaica ...	Government Meteorologist.

Europe.

Austria-Hungary.

Agram ...	Landes Anstalt.
Brünn ...	Natural History Society.
Buda-Pesth ...	Central Meteorological Institute.
Cracow ...	Observatory.
Fiume ...	Nautical Academy.
Innsbruck ...	Observatory.
Kremsmunster	Observatory.
Laibach ...	Observatory.
Lemberg ...	Technical High School.
O'Gyalla ...	Observatory.
Pola	Hydrographic Office.
Prague ...	Hydrographic Office.
	Observatory.
	Royal Society of Sciences.
	University Library.
Trieste ...	Observatory.
Vienna ...	Austrian Meteorological Society.
	Central Hydrographical Bureau.
	*†Central Meteorological Office.
	*Hann, Hofrath Dr. J.

Belgium.

Brussels ...	*†Observatory (Uccle).
Ostend ...	Navigation School.

Bulgaria.

Sofia	Central Meteorological Station.

Denmark.

Copenhagen ...	Hydrographic Office.
	International Council for the Study of the Sea.
	Meteorological Institute.
	Society of Sciences.

Europe—*cont.*

France.

Besançon ...	National Observatory.
Bordeaux ...	Society of Oceanography of the Gulf of Gascony.
Chevreuse à Jagny.	Observatory.
Lyons	Observatory.
Marseilles ...	Meteorological Commission.
	Observatory.
Nice	Observatory on Mont Blanc.
Paris	Bureau des Longitudes.
	*†Central Meteorological Office.
	Hydrographic Office.
	Hydrometric Service.
	Institute of France.
	Meteorological Society.
	Municipal Observatory.
	National Observatory.
	Observatory of Parc St. Maur.
Perpignan ...	Meteorological Commission.
Puy-de-Dôme	Observatory.
Toulouse ...	Observatory.

Germany.

Aachen ...	Meteorological Station.
	Seismical Station.
Berlin ...	Hydrographic Office.
	*†Meteorological Institute.
	Royal Academy of Sciences.
	Weather Bureau.
Bremen ...	Meteorological Observatory.
Breslau ...	University Observatory.
Carlsruhe ...	Central Meteorological Office.
Darmstadt ...	Hydrographical Bureau.
	Physical Institute.
Dresden ...	Meteorological Institute.
Frankfort ...	Physical Society.
	Weather Service.
Gotha	M. Justus Perthes' Geographical Institute.
Göttingen ...	University, Geophysical Institute.
Greifswald ...	Geographical Society.
Halle	Leopold-Carolin Academy.
Hamburg ...	*†Deutsche Seewarte.
	Geophysical Station.
	Schück, Capt. A.
	Seismical Station.

* Receive all publications, including the Daily Weather Report in those cases which are also marked †.

List of Institutions receiving Publications—*cont.*

Europe—*cont.*	
Germany—cont.	
Jugenheim, Rheinhessen.	Seismical Station.
Kiel	Commission for the Exploration of the German Ocean.
	Magnetical Observatory of the Physical Institute of the University.
Leipzig ...	University Library.
Lindenberg ...	Royal Prussian Aeronautical Observatory.
Magdeburg ...	Observatory.
Munich ...	Central Meteorological Office.
	Observatory.
Neustadt ...	Forest Academy.
Potsdam ...	Central Office of International Earthmeasurement.
	Magnetical Observatory.
Strassburg ...	Meteorological Agricultural Service.
Stuttgart ...	Central Meteorological Office.
	Imperial Station for Earthquake Investigation.
Wilhelmshaven	Observatory.
Greece.	
Athens ...	Observatory.
Italy.	
Catania ...	Meteorological Observatory.
Florence ...	Observatory.
Messina ...	Observatory.
Milan	Observatory.
Moncalieri ...	Observatory.
Naples ...	Observatory.
Pompeii ...	Observatory of Pius X.
Palermo ...	Observatory.
Pesaro ...	Observatory.
Riposto ...	Observatory.
Rome	Central Meteorological Office.
	International Agricultural Institute.
Turin	Observatory.
Venice... ...	Hydrographical Office.
	Observatory.
Netherlands.	
Amsterdam ...	Geographical Society.
	Meteorological Institute.
Helder ...	Institute for the Study of the Sea.
Utrecht, (De Bilt).	*†Royal Meteorological Institute.

Europe—*cont.*	
Norway.	
Bergen ...	Meteorological Observatory.
Christiania ...	Meteorological Institute.
Portugal.	
Coimbra ...	Observatory.
Lisbon ...	Observatory.
Oporto ...	Polytechnic Academy.
Azores.	
Ponta Delgada	Observatory.
Roumania.	
Bucharest ...	Meteorological Institute.
	Seismical Station.
Russia.	
Ekaterinburg	Observatory.
Helsingfors ...	Society of Sciences.
Jurjev ...	Observatory.
Kazan ...	Observatory.
Kieff	Observatory.
Koutchino ...	Aerodynamical Institute.
Mokeevka ...	Seismical Station.
Moscow ...	Observatory.
Nicolaieff ...	Hydrographic Office.
Odessa ...	Observatory.
Pavlovsk ...	Observatory.
Pulkova ...	Seismical Station.
St. Petersburg	Central Seismical Commission.
	Hydrographic Department.
	Imperial Institute of Forestry.
	Imperial Russian Geographical Society.
	Naval Academy.
	*†Nicolas Central Physical Observatory.
Tachkent ...	Astrophysical Observatory.
Tiflis	Observatory.
Warsaw ...	Meteorological Bureau.
Servia.	
Belgrade ...	Central Observatory.
Spain.	
Barcelona ...	Llinas Observatory.
Burgos ...	Observatory.
Granada ...	Cartuja Observatory.
Guardia ...	Observatory.

* Receive all publications, including the Daily Weather Report in those cases which are also marked †.

List of Institutions receiving Publications—*cont.*

Europe—*cont.*

Spain—cont.

Madrid ...	Central Meteorological Institute.
	Observatory.
	Observatory, Chamartin de la Rosa.
Malaga ...	Society of Sciences.
San Fernando	Observatory.
Tortosa ...	Ebro Observatory.
Vilafranca del Panades.	Observatory.

Sweden.

Stockholm ...	Central Meteorological Institute.
	Hydrographic Office.
	Nautical Meteorological Bureau.
	Royal Academy.
Upsala ...	Meteorological Observatory.

Switzerland.

Berne	National Hydrography.
Geneva ...	Geographical Society.
	Observatory.
Lausanne ...	Society of the Vaudoise.
Neuchâtel ...	Observatory.
Zürich... ...	Central Meteorological Office.
	Helvetic Observatory.

Turkey.

Constantinople	Meteorological Observatory.

Africa.

Algiers ...	Meteorological Service.
Cairo	Sanitary Department.
	*† Survey Department.
Madagascar ...	Royal Observatory, Antananarivo.
Zomba ...	Director of Agriculture.

America.

United States.

Albany ...	State Hydrographer.
	State Library.
Albuquerque...	University of New Mexico.
Allegheny ...	Observatory.
Baltimore ...	Maryland Weather Service.
Berkeley ...	University of California.
Blue Hill ...	Blue Hill Observatory.
Boston ...	The World Peace Foundation.

America—*cont.*

United States—cont.

Cambridge, Mass.	Harvard College Observatory.
Chicago ...	Yerkes Observatory.
Cleveland ...	St. Ignatius' College Observatory.
Columbus ...	Emerson McMillan Observatory.
Newhaven ...	Yale University, Observatory.
New York ...	American Geographical Society.
	Central Park Observatory.
Pasadena ...	Mount Wilson Solar Observatory.
Philadelphia ...	American Philosophical Society.
	Franklin Institute.
Reno	Mount Rose Observatory.
Washington ...	Chief Signal Officer.
	Department of Agriculture.
	Carnegie Institution, Department of Terrestrial Magnetism.
	Editor, Terrestrial Magnetism.
	Hydrographer's Office.
	National Academy of Sciences.
	Naval Observatory.
	Research Observatory of the Weather Bureau, Mount Weather.
	Smithsonian Institution.
	Coast and Geodetic Survey.
	Surgeon General's Office.
	*†Weather Bureau.

Mexico.

Guanajuato ...	Observatory.
Leon	Meteorological Observatory.
Mexico ...	"Antonio Alzate" Scientific Society.
	Central Meteorological Observatory.
Morelia ...	Meteorological Observatory.
Oaxaca ...	Observatory.
Puebla ...	Boletin de Estadistica.
Saltillo ...	Observatory.
San Luis Potosi.	Observatory.
San Salvador	Observatory.
Tacubaya ...	Mexican National Astronomical Observatory.

* Receive all publications, including the Daily Weather Report in those cases which are also marked †.

List of Institutions receiving Publications—*cont.*

America—*cont.*	
Central America, West Indies.	
Belize	Colonial Secretary.
Costa Rica ...	Meteorological Institute.
	San José Physical Institute.
Guatemala ...	Central Laboratory.
Havana ...	Observatory.
	Central Meteorological Station.
Porto Rico ...	Engineer in Chief.
Argentina.	
Buenos Aires..	Meteorological Office.
	Mons. Lasagna Observatory.
Cordoba ...	Astronomical Observatory.
	Meteorological Office.
	National Academy.
Brazil.	
Porto Alegre...	Azambuja, Sr. G. A. de
Rio de Janeiro	Meteorological Department.
	Observatory.
Rio Grande de Sul.	Astronomical Observatory.
São Paulo ...	Secretary of Agriculture, &c.
America—*cont.*	
Chile.	
Santiago ...	Central Institute of Meteorology and Geophysics.
Valparaiso ...	Meteorological Service.
Ecuador.	
Quito... ...	Observatory.
Uruguay.	
Monte Video ...	National Physical Institution.
	Observatory, Villa Colon.
Asia.	
Batavia ...	Observatory.
	Ksara Observatory.
Beyrout ...	Lee Observatory.
Chemulpo ...	Observatory.
Irkutsk ...	Observatory.
Manila ...	Meteorological Observatory.
Tokio	Imperial Meteorological Observatory.
	Imperial University, Seismological Institute.
	College of Science.
	Prince Tamashira.
	University.
Zi-ka-wei ...	*Observatory.

* Receive all publications, including the Daily Weather Report in those cases which are also marked †.

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